AUGUST
1950

PEST CONTROL

FORMERLY PESTS AND THEIR CONTROL

PCOs say house mice give them most trouble. Dykstra and Emlen give clues to mouse control in this issue.

MAGAZINE OF THE PEST CONTROL
AND ALLIED SANITATION SERVICE INDUSTRIES

about POWCO BRAND LINDANE

POWCO BRAND LINDANE *is considerably more toxic than DDT against house flies.*

POWCO BRAND LINDANE *for fly control has a residual effectiveness lasting from three to six weeks, according to U.S.D.A. reports.*

POWCO BRAND LINDANE *meets approval of U.S.D.A. for use in dairy farms and on dairy animals—and in household sprays.*

POWCO BRAND LINDANE *is available in three forms: 10% Emulsion Concentrate, 10% Oil Soluble Concentrate, 25% Wettable Powder*

Ask for technical bulletin on your business letterhead.

LINDANE
ALLETHRIN
DDT POWDERS AND LIQUIDS
CHLORDANE POWDERS AND LIQUIDS
PYRETHRUM POWDERS AND EXTRACTS
PYRINS
AEROSOL FORMULATIONS
STIMTOX A
PYRISCENTS (insecticide perfumes)
BOTANICALS • ROTENONE • SABADILLA
ANTU
2,4-D and INPC WEED KILLERS
BHC POWDERS AND LIQUIDS
COTTON DUST CONCENTRATES
TOXAPHENE POWDERS AND LIQUIDS
TETRAETHYL PYROPHOSPHATE

Look to Powell... for Lindane!

John Powell & Co., Inc.

ONE PARK AVENUE, NEW YORK 16, N. Y.

Sales Offices: Philadelphia • Pittsburgh • Huntsville • Chicago • Fort Worth • Denver • San Francisco
Canada: Charles Albert Smith, Ltd., Toronto, Montreal • Argentina: John Powell y Cia
Representatives in Principal Cities of the World

POWCO BRAND

KILLING POWER—THAT'S THE THING!

There's No DULL Season for Termites

TERRA TOX WORKS Over-time KILLIN'

EVERY HOUR... EVERY SEASON!

Yes, sir... termites do their deadly damage, under cover, around the clock! There's **no** let up in their destruction, **no** time when they're not undermining wood structures! But... ***TERRA TOX*** works ***fast*** and ***constantly,*** too... effectively knocking out termites and powder post beetles everywhere... every time! Terra Tox is so powerful because it contains Monsanto's Penta, famed chemical that assures ***lasting*** results!

THERE'S a TERRA TOX for every control problem.

255 Concentrate, 10 to 1, One Gallon makes 11 gallons!

235 won't stain... almost odorless, when diluted one to four with light petroleum oils.

245 speedy and deadly... contains Penta and Orthodichlorbenzene.

225 slightly dark, ideal where discoloration is not objectionable.

218 is Odorless, ideal for buildings where foodstuffs are stored.

THEY'RE *Yours* FOR THE ASKING:

- TERRA TOX Manual of Instructions
- MAILING PIECE (at nominal cost)
- ADVERTISING MATS.
- Reprints of TERRA TOX National Ads.

WOOD TREATING Chemicals Co.

5137 SOUTHWEST AVENUE
SAINT LOUIS 10, MISSOURI

investigate the new Dyna-Fog JET FOG GENERATOR ... Before Buying Fog Equipment

A Revolutionary New Concept in Fog Generation

100% JET OPERATED

APPEARANCE BUILDS - PRESTIGE

Professional prestige accompanies the neat, functional design, with contrasting polished chrome and black wrinkle finish of fine scientific instruments.

A LIGHT WEIGHT PORTABLE Machine That EASILY DOES The HEAVIEST FOGGING JOBS!

Produces at *least as much fog* as 650 lb. and heavier machines.

The MOST ECONOMICAL and PRACTICAL Applicator for ALL TYPES of INSECTICIDAL FOGGING

COMMUNITIES	FAIRS	AUTO COURTS	HATCHERIES
MUNICIPALITIES	RESORTS	RACE TRACKS	GREENHOUSES
TOWNSHIPS	ESTATES	HOTELS	FACTORIES
PARKS	HOMES	COUNTRY CLUBS	WAREHOUSES
PICNIC GROUNDS	FARMS	BEACHES	SHIPS' HOLDS
DRIVE-IN THEATERS	RANCHES	DAIRIES	RAILROAD CARS

A BARGAIN AT $1185.00

F.O.B. Vandalia, because easily does every job that old fashioned heavy machines can do. PLUS doing work impossible except with a portable machine.

OPENS NEW FIELDS FOR FOGGING!

LIGHT WEIGHT AND PORTABLE!

Weighs only 100 pounds. Easily moved to most advantageous position for indoor or difficult location jobs. Readily removable from motor vehicles to avoid "tying up" trucks or jeeps during "off" season or between jobs.

MINIMUM MAINTENANCE COST . . . MAXIMUM RELIABILITY!

Operates with only three moving parts; virtually nothing to go wrong. Requires no lubrication. Has no rotating parts. Years of dependable operation assured.

MORE AND BETTER FOG!

Laboratory tests show extremely dense fog output at rates up to 40 gallons per hour. Analysis of fog shows uniform particle size, assured by exclusive pulsating jet system of operation.

LESS HEAT APPLIED TO INSECTICIDE!

Killing power proven by laboratory test. Jet gases pulsating at sonic velocity pulverize insecticide formulaton with minimum application of heat. Less "breakdown" of insecticide. More kill per formulate dollar.

TESTED AND PROVEN IN BOTH LABORATORY AND PRACTICAL FIELD SERVICE!

In addition to laboratory tests the DYNA-FOG Jet Fog Generator has been utilized with great success in commercial pest control operations throughout the 1949 pest season.

SELECTIVE FOG PARTICLE SIZE!

Fog particle size varied by simple control offering range from 0.5 micron for dryest indoor fogs to 75 microns for wetting down dumps, swamps, etc.

Dyna-Fog Corp.
DAYTON MUNICIPAL AIRPORT
VANDALIA, OHIO

Choice distributor territories still open. Inquiries from qualified firms are invited.

ABC's of Business

Just because you're making a profit doesn't mean you couldn't be making more by streamlining the "front-office." With the economic controls that may be necessary because of the Korean situation, efficient business methods may mean the difference between making a profit or just breaking even.

Too little attention has been given to the management side of pest control operations. We're glad something is being done about that situation at the forthcoming NPCA convention in Cincinnati this October. It's theme is to be, "Business Is Like That."

. The need for up-to-date information on advertising, bookkeeping, personnel management and other phases of the business is urgent. Last month Herman Fellton gave some top-notch ideas on how to train servicemen. In October we shall publish an article by R. L. Hawks on "Direct Mail Advertising for the PCO." It is packed-full of ideas and instructions on how to go about using this sales medium.

Last winter *Pest Control* deided to make a search of existing literature on bookkeeping for pest control operators to review it for our readers. When we discovered nothing has ever been written on the subject, an executive accountant with Harvard training was commissioned by us to study the industry and to prepare a system that would enable PCOs to keep a simple set of books that will reveal true costs and give information needed for tax reports. This article has been completed and will begin in next month's issue. It is something every owner and manager should read.

James A. Nelson

Editor

PEST CONTROL

FORMERLY PESTS AND THEIR CONTROL

JAMES A. NELSON
Editor

GEORGE J. SOTAK, JR.
Editorial Assistant

KARL HASSLER
West Coast Representative

AUGUST, 1950 **Vol. 18, No. 8**

CONTENTS

Letters to the Editor 6

A Review of the History, Ecology and Economic Importance of House Mice
By Walter W. Dykstra 9

How Far Will a Mouse Travel To a Poisoned Bait?
By J. T. Emlen, Jr. 16

Here Are Some Unique Rat Hide-Outs
By H. H. Slawson 20

NPCA Convention News 22

True Weevils — Pest Control Primer 24

Home For Mud Dauber Wasps — Pest Control Notebook
By Douglas Katos 24

Pest Control Chaos and War — Editorial 27

Pest Control News 28

Organization News 36

Calendar of Meetings 36

Extract From Experiment Station Reports
By Paul Herbert 41

Medical Entomology, book review 41

Classified Advertisements 41

Pestales 42

Advertisers' Index 42

Cooperating with

NATIONAL PEST CONTROL ASSOCIATION

Published Monthly by
TRADE MAGAZINES, INC.
Publication Office: 324 N. State St., Painesville, O.
Editorial and Advertising Offices
1900 Euclid Building, Cleveland 15, Ohio
Please send correspondence to our Cleveland office.

Single Copy Price: 50 cents. **Subscription Rates:** 1 year, $4.00; 2 years $7.00. Add 50 cents a year for Canadian and foreign postage. **Change of Address:** Three weeks advance notice is necessary for change of address. Both old and new address must be given. Post Office will not forward copies. **Entered as Second Class Matter** at the Post Office at Painesville, Ohio, under the act of March 3, 1879.

LETTERS

Questions Rodent Disease 'News'

I read with considerable amazement the doubt inferred in your comment *(Pest Control, July 1950, page 6)* as to the possibility of rabbits being subject to plague epidemics especially since my investigations as far back as 1938 established for me this possibility as fact. That little or no evidence existed to support this belief likewise came as quite a surprise to me as I recall reading several references that most certainly verify the claim. Not only the rabbit but the ground squirrel and the reptile are subject to similar plague epidemics.

I should prefer to withhold final criticism of the case history referred to in your commentary until the government report which I have already sent for is received but at this writing I strongly suspect that an error in diagnosis has been made and believe that the infection was caused by pasturella tularensis instead of pasturella pestis. The fact that the symptoms of these two infections are surprisingly alike in character raises the doubt in my mind but more than that if the original diagnosis is correct it will doubtless prove to be the first of its kind in history that has been transmitted by the rabbit.

Permit me to outline in detail the symptoms of these two infections:

Malignant Polyadenitis (Bubonic plague) is an acute febrile and exceedingly fatal epidemic disease produced by pasturella pestis. It begins with fever and chills quickly followed by great prostration similar to that of the typhoid state resulting in lymphadenitis of the femoral, inguinal, cervical or axillary regions. The plague attacks rats, reptiles, and various animals but herbivorous animals are little liable to it. The disease is almost always transmitted by the bite of xenopsylla cheopis. Now consider: the rabbit is an herbivorous animal. Xenopsylla cheopis is the flea carried by the black rat which is primarily a pest in coastal or seaport communities being driven there by its more aggressive brother the brown rat. Maljamar, New Mexico, to my knowledge is not a coastal town.

Tularemia: so-called because in the town of Tulare, California it was first identified; an acute, fatal, plague-like disease of rodents caused by pasturella tularensis. There are four types of infection and of the oculoglandular type comprising roughly 6 per cent of the cases involves regional lymphadenitis principally of the head and neck and, if severe, of the axillary region. The onset of the disease is likewise accompanied by fever and chills. It is transmitted by the bites of ticks, fleas, flies, and bedbugs. Infection may be acquired by handling infected tissue or body fluids or in connection with dressing or cleaning diseased animals such as rabbits, woodchucks, or laboratory animals. The disease is predominant in rural districts among those exposed to ticks and flies especially those handling wild rabbits such as hunters, cooks, and marketmen.

Ordinarily rabbits and squirrels do not generally live in filthy environments such as we find rats existing, nor do we find them in confining habitues as in the case of rats. Further rabbits and squirrels are often exposed to strong sun light and warm air which destroys plague bacteria. Despite the fact that these factors limit the possibility of wholesale epidemics among rodents other than rats it does not altogether exclude the possibility of their becoming plague infected.

In connection with an article in the same issue of *Pest Control (July 1950, page 19)* pertaining to the recent experiments to establish the roach as a transmitter of Salmonella here again I pause to smile. Frankly I'm beginning to wonder just how far behind the times our government investigators are. As far back as 1926, Macfie, I believe, established the fact that roaches were capable and did transmit salmonella organisms by way of its intestinal tract. In his experiments with Periplaneta Americana he lists the following organisms as also passing unaltered through the digestive tract: Bacillus tuberculosus, B. leprae, cysts of Entamoeba histolytica, E. coli. He found that active and virulent tubercle bacilli appeared in the feces from two to five days after being permitted to feed on infected sputum. The german roach figured chiefly in passing nematodes in its dung. Flies appear to be the greatest single source of Salmonella distribution. They maintain active bacteria throughout their entire life cycle. Flies feeding on infected food are capable of infecting other flies as well as water and other foodstuffs. Fly eggs placed in infected mash gave rise to infected maggots, pupae, and adults. What makes it doubly dangerous is that the bacteria can be carried on its body parts as well as in its feces and stomach regurgitants.

Michel J. Guion

President
Pied Piper Exterminating Co.
Miami Beach, Florida

Tindol Cautions Ga. PCA On Price-Cutting

A valuable warning on price-cutting was sounded to members of the Georgia Pest Control Association by its recently elected president R. L. Tindol, Jr., Orkin Exterminating Co., Atlanta.

In a service letter to association members, Mr. Tindol cited Georgia's chenille industry, which a few years ago had price-cut itself into bankruptcy. He pointed out that only by forming an association, and educating their people to realize the necessity of keeping accounting records and setting prices that reflect true cost evaluation, was the chenille industry able to build back a profitable price level. "Our pest control industry in Georgia could well afford to benefit by the mistake of the chenille industry," he said.

Referring also to customer cooperation, Mr. Tindol suggested that PCOs put themselves on record to the customer when repeated verbal requests fail to bring about sanitation improvements.

NEW! *designed especially for* PCO's

B & G Co's one gallon STAINLESS STEEL SPRAYER

TRULY PROFESSIONAL and here's why:

- **DURABLE** — tank is electrically seam-welded. Premium quality stainless steel protects against corrosion and subsequent breakdown of chemicals.
- **IDEAL CAPACITY** — no need to carry twice your requirements. One gallon tank will hold enough material for most any job.
- **EASY TO HANDLE** — only 5½ lbs. complete. Can be carried in hand or hung over shoulder.
- **QUICK-ACTING SHUT-OFF** — sturdy brass valve is designed for precision control.
- **SPECIAL HOSE — 4 ft. of OIL, CHEMICAL** and **ABRASION-RESISTANT** hose. Far above average strength, yet remarkably light and flexible.
- **PRECISION NOZZLE** — fan pattern nozzle is designed to give perfect spray distribution without excessive atomization.

No. 100-S — As Illustrated **$24.50**

ONE SPRAYER THAT DOES THE WORK OF TWO
Cut Sprayer Costs with the

New Multijet Nozzle

Model 104-S. Four types of spray pattern can be had by rotating tip and tightening retainer ring with finger pressure.

Price **$27.23**

Interchangeable Wands

Model 102-S. Available with two wands and a special coupler allowing you to change from a solid stream to a fan type spray pattern with a twist of the fingers.

Price **$28.15**

ALL PRICES F. O. B. FACTORY, PHILADELPHIA, PA.
SHIPPING WEIGHT 7 LBS.

PROFESSIONAL IN APPEARANCE . . . too!

Neat and functional in design, high polish adds to its distinctive appearance.

•

B & G Company

"Serving the Pest Control Industry"

4725 Rising Sun Avenue, Philadelphia 20, Pa.

DETHMOR..

Graduates Cum Laude

NOW SOLD FOR GENERAL USE

DETHMOR.. treatment is a *continuous control procedure* quite different from methods heretofore standard or customary.

DETHMOR.. feeds rats and mice minute doses of an anti-blood coagulating chemical over a five, ten or fifteen day period – doses so small that hazards to humans or household pets are almost negligible. Of course, since it is a rodenticide, care is necessary when using, and our label gives valid cautions.

DETHMOR.. baits are acceptable to rats and mice from start to finish; no bait shyness develops!

DETHMOR.. is formulated from warfarin (newly coined common name for Compound 42) under precise laboratory control. Mix 19 parts bait with 1 part Dethmor, and 85% to 90% control may be expected.

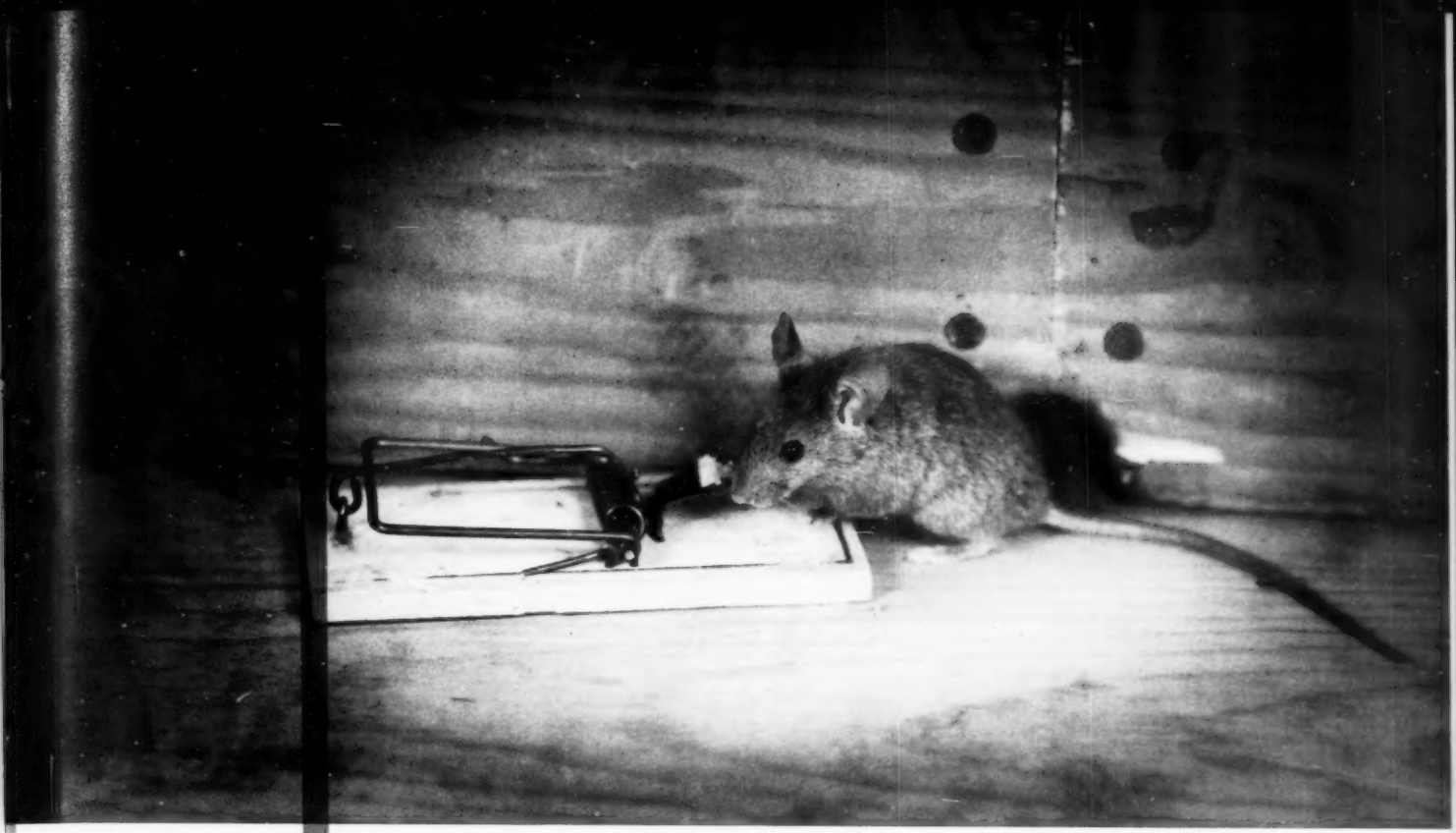
WRITE FOR FURTHER INFORMATION

S. B. PENICK & COMPANY

50 CHURCH STREET, NEW YORK 7, N. Y.
Telephone, COrtlandt 7-1970

735 WEST DIVISION STREET, CHICAGO 10, ILL.
Telephone, MOHawk 5651

BOTANICAL DRUGS • ESSENTIAL OILS • MEDICINAL CHEMICALS • AROMATIC CHEMICALS



"Suicide" by E. R. Kalmbach

A REVIEW OF THE HISTORY, ECOLOGY AND ECONOMIC IMPORTANCE OF

HOUSE MICE

by

WALTER W. DYKSTRA
Fish and Wildlife Service
Washington, D. C.

ACCORDING TO Schwartz and Schwartz, [1] there are, throughout the World, four subspecies of wild house mice belonging to the species *Mus musculus Linnaeus*. Associated with each of these are several races of commensal forms. Thus, there are at least 15 different kinds of this particular rodent, some of which exist only in a natural wild state completely independent of man.

Three of the four forms have long been associated with human habitation, and their places of origin are known to be certain grain producing agricultural areas of central Asia, extending from southern Russia through portions of India, China, and Japan. *Mus musculus wagneri*, one of the four wild subspecies, has evolved two commensal forms, *Mus musculus domesticus* and *Mus musculus brevirostris*, which are found in the United States. The subspecific *domesticus* group was transported to America from northern European countries by the early colonists and is the mouse now found in northern states. The other race, *brevirostris*, averages somewhat smaller in size and was apparently carried by early Spanish explorers to the Latin American countries and southern United States. In the central states, ranges of the two subspecies overlap, and both forms may be present in the same area. Outdoor and indoor types of the same subspecies are found, the former being either wild or commensals less specialized than the indoor type. The wild rodents are characterized by white bellies and slightly shorter tails, whereas the more specialized and well-known commensals possess gray bellies and long tails.

While the two above-mentioned subspecies occur within this country, [2] their habits are nearly identical and differences so minute that classification is not of interest to most persons engaged in control operations. However, they should not be confused with our native mice, and it should be noted that well over 250 different forms of native mice occur in North America, [3] and that rats and mice probably comprise about 1/4 of all our animals. House mice are

greatly out-numbered by two of the native species, the meadow and white-footed mice. (Figure 1). Although well known, this introduced rodent is sometimes mistaken for one of these country cousins, the white-footed mouse *(Peromyscus)*, which occasionally enters the same premises, particularly during late fall in semi-rural areas where it creates somewhat similar damage. House mice vary widely in color, but generally are characterized by tawny to dark gray fur on the back, the color gradually changing to ashy gray on the abdomen. The eyes are smaller; feet shorter, broader, and darker; the tail shorter; and color different than is true in the case of white-footed mice. Total length is 6 to 6½ inches, and tail measurement is 3 to 3½ inches.

Since Biblical Times

As in most other parts of the world, the house mouse undoubtedly preceded entry of Norway rats into North America, and its history throughout Europe, Asia, and Africa dates back to Biblical times. In fact, historical records, including the writings of Aristotle and Pliny, mention mice long before rats were referred to as pests of mankind. The term "Mus" means "to steal" and very appropriately describes these rodents. Their presence is more difficult to detect than rats and, consequently, house mice have freely travelled with man and are now present in homes, barns, granaries, warehouses, factories, and stores in all portions of the country. In some sections of the Midwest, South and Southwest, they have become feral or wild and exist in the fields throughout the year.

The numbers of such mice undoubtedly exceed those of rats in most localities, and presence of both species of rodents in the same structure frequently occurs, although they do not intimately associate with each other. During recent years, there have been indications that house mice tend to increase as better rat control is attained, due to a number of factors, including less competition for available food and differences in control measures required. Lindsey, an employee of the Fish and Wildlife Service, has reported one observation of actual predation upon mice by rats. The degree and effect of such predation in nature is unknown.

Infestations of several thousand mice have been reported within relatively small, confined areas, and the English investigator, Laurie, noted that their numbers in stacks of stored grain totalled as many as .43 mice per cubic foot. (4) Historical records reveal many instances of periodic cycles in mouse abundance, particularly among field mice and lemmings. The number of house mice are known to periodically fluctuate. They occurred in tremendous numbers during an Australian mouse plague in 1916, when populations were estimated as high as 80,000 per acre or 17 per square yard in stacks of grain stored in the open. A smaller, but somewhat similar outbreak among both house and field mice occurred on California farms in 1926, at which time three horse-cart loads of the mice were killed on a single ranch during a period of only a few days. (5) Infestations of 82,280 were estimated present in fields of kafir corn. Hall calculated the weight of mice in the area at 2468 pounds per acre, the ratio being about 85% house mice and 15% meadow mice. (6)

Economic Status

THE ACCUMULATED destruction caused by this particular species is thought to equal or exceed that caused by rats in many localities since most people tolerate their presence, and damage is more difficult to detect, being seldom reported. They also exist in larger numbers, nibbling and contaminating much more than they eat. In addition to being a nuisance, they inflict damage to a wide variety of food products, paper goods, and items of clothing.

These mice have been known to chew book binding, shred cloth, ruin upholstery, and even spread fungus diseases on mushroom farms. They may also be a factor in the spread of certain insect pests which live upon cereal and grain products. Some idea of their tremendous potential destructiveness may be gained from reports during the California mouse plague which stated in part: "A stack of barley hay literally alive with house mice had been completely riddled and all the grain consumed. Of ninety-one sacks of wheat sown on January 20, only fragments of the outer hulls remained on January 23. Shortage in crops due to the mice in 1926 is thus estimated at 10,000 sacks of barley, more than this amount of milo maize, besides a greater amount of wind-lodged maize that would have otherwise served as feed." (5)

Disease Vectors

Any consideration of economic losses must also include certain diseases of mankind known to be transmitted by them, particularly several forms of food poisoning. During recent years, large quantities of food and raw products have been annually condemned by health inspectors because of contamination by the rodents in food processing plants. Undoubtedly much larger amounts of food thus contaminated have escaped detection, and in all probability, every man, woman and child annually and unknowingly consumes some products which have been exposed to or fouled by this mammal. During the period 1938-45, Public Health Service records indicated 12,102 cases of food-borne diseases in milk, 112,000 in water, and 57,600 in food, half of the latter occurring in public eating places. The part played by house mice in transmitting such diseases cannot be estimated, but should not be overlooked.

A discussion of economic status would be incomplete without some recognition of contributions by the albino laboratory variety of house mice which have aided advancement of knowledge more than any other experimental animal. Over a million such mice are raised each year in this country for research purposes, particularly in the field of medicine. Benefits thus gained help to offset much of the economic losses charged to the species as a pest to mankind.

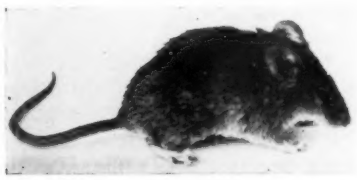
Life History

ALTHOUGH considerable study had been devoted to the economic importance, life history, habits and control of different species of field mice by Elton [8] and other investigators, house mice have been somewhat neglected in research studies until recent years. Barrett-Hamilton conducted a rather thorough study of their habits and ecology about 1915. [7] Other more recent work by Laurie, [4] also in England, now confirms and augments earlier data on life history which indicates that the average litter size ranges from six to eight young, and that the female may produce from six to ten litters per year, as many as fourteen being recorded. Depending on environment, the total number of young per female per year ranges from thirty to fifty-seven. It is interesting to note that these mice sometimes raise their young in communal litters — two or three females may sometimes produce young in the same nest at the same time, and as many as 50 young have been found in a single nest. Females usually slightly outnumber males, and the weight averages are about equal, the majority being between ten and twenty grams each. The heaviest recorded was a forty-gram female.

The gestation period of laboratory mice, the albino form of house mice, varies according to strain, and averages about 19.5 days. Investigators do not all agree, but some have found that this period may range from about 21 to 24 days among ordinary house mice. Such mice living indoors show about the same breeding rate for all seasons of the year, while those living outside show slightly increased breeding activity during summer and fall months. Laboratory mice can live for several years, but, as in the case of rats, probably few house mice survive longer than one year under natural conditions.

The young are born blind, hairless, and pink in nests of shredded paper, cloth, etc. Pelage begins to show on the 6th day and is quite complete one week later. Eyes open on the 14th or 15th day. They become independent of the mother in about three weeks, and sexually mature in two to three months.

Above:
White-Footed Mice



House Mouse

(Figure 1)

Meadow Mouse

Habits and Habitat

THESE MAMMALS have keen senses, except that of sight. They are highly nervous, good natured, curious, excellent climbers, jumpers, and can swim well. House mice are able to flourish and increase in extreme temperature variations—infestations are frequently maintained in cold storage plants, where temperatures range from five to ten degrees below zero, and under such conditions, the mice develop heavy fur and build warm nests in the insulation. Although originally dry land burrowing animals, they are able to exist in a wide variety of habitats, ranging from tunnels beneath foundations to boxes of stored goods left in attics.

The expression "poor as a church mouse" is appropriately derived from the fact that this species is often apparently able to exist in places where the presence of food is not evident. Since they are able to gain access to buildings through openings and cracks one-half inch in diameter, and as they are transported along with contents of boxes and crates, infestations frequently appear almost overnight from unknown sources. In fact, at one time European scientists regarded house mice as an example of spontaneous generation and attempted to prove this theory by experiments whereby a piece of cheese and strip of cloth were placed in a dark box and in which mice usually soon appeared.

Food Preference Varies

While omnivorous, and known to even eat various household insects, including flies, their preferred foods are many types of seeds, grain and cereal products. They are fond of cornmeal, rolled oats, apple, sweet potato, flower seeds, bacon, peanut butter, nut meats, sweet chocolate, etc. According to Mills, [9] they are light, intermittent, and eratic feeders. As mice eat about 10 per cent of their body weight every 24 hours, and since they may feed 15 to 20 times a day, only about .1 to .2 grams of food is consumed at each feeding. They seem to prefer sweet foods and those high in protein content. British studies indicate that food preference is associated with normal diet available. Mice living in stacks of stored flour readily accept a change in food when first offered,

but within a few days return to consume larger quantities of the original item to which they are accustomed. H. J. Spencer [11] has noted that these mice are able to exist for periods exceeding four months without water, and that food preference varies from dry cereals (cornmeal, rolled oats, etc.) in the presence of ample water supply to moist foods (apple, etc.) in the absence of water.

When food is abundant, their range may be extremely limited, and several investigators have reported that the rodents may spend their entire lifetime in a single stack of grain [10] or within a 25 foot radius. [11] (Figure 2). On the other hand, an activity radius of surprising extent was noted by Piper in the California outbreak during 1926 which revealed nightly excursions by house mice into wheat-seeded fields and their retirement by day to buildings and fence rows nearly a half mile distant. The latter incident was unusual, and it should be noted that the ordinary restricted movement of the mice is an important factor to consider when instituting control measures.

Evidence of their presence is distinguished from rats by smaller droppings and characteristic damage marked by little holes and other gnawing with their small incisor teeth. Most infestations are easily detected by such damage and accompanying sounds which the mice make, and by their physical presence as they scamper about or are disturbed from nests and other hiding places. A rather disagreeable pungent, musty manure odor is often noticed in buildings which harbor heavy infestations.

Laurie noted both night and day activity, although it was probably greater at night and varied somewhat because of disturbances by man. Family existence is quite apparent, and the presence of one mouse usually means that several others are nearby. These rodents appear to be more peaceful and socially inclined than is true in the case of rats. However, studies by Scott indicate that social dominance of individuals is based on fighting ability and that their society is probably fluid and dispersive in nature with shifting ranges and badly defined territories. [12]

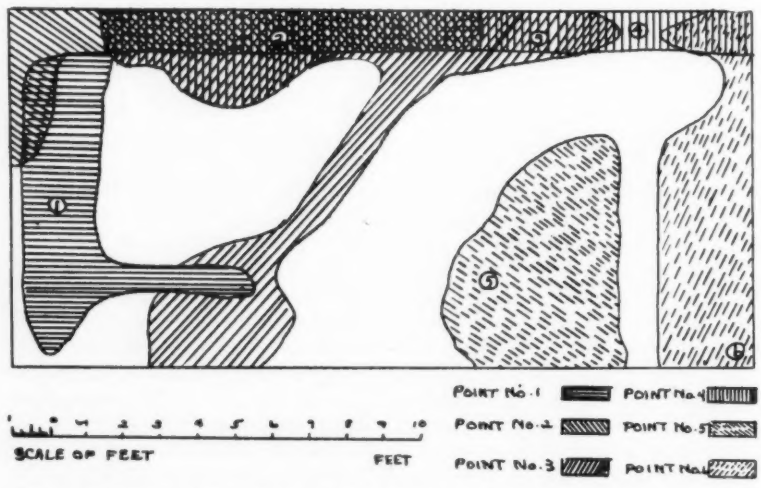
California Outbreak

Movement indoors during fall months is frequently reported, [13] although many colonies probably remain in one location when undisturbed and when food and shelter are adequate. With the exception of the California outbreak, there is little evidence in literature to indicate widespread migrations by house mice. Most movement is probably unintentional through transfer of nests and other harborage along with boxes and crates of food, clothing and various products of mankind. Migration during the California mouse plague was described by Piper as follows: "A vast aggregation of House Mice issued on November 24, 1926, from the basin maize-fields. Other aggregations involving many hundreds of thousands of these rodents from the maize lands, emerged from the basin at four or five different points December 8 to 10. A third exodus quite as great occurred January 10 to 12, 1927. The mice streamed quickly across the intervening desert to the few and widely scattered human dwellings. Ranch houses 3 to 10 miles distant experienced sudden visitation. Stacks of grain hay, empty shacks, and places long abandoned apparently attracted thousands of the mice. Establishments in the oil fields, including several communities 3 to 6 miles west of the basin, were overrun. On the second night following the start of the main marches, there was a sudden invasion by mouse hordes of the towns Midland and Taft, 8 miles west, and of Monarch and Maricopa somewhat farther to the southwest." [5]

Parasites and Diseases

WHILE house mice are cleaner animals than the rats and generally do not harbor such large numbers of external parasites, studies of the laboratory variety indicate that, "they have not been slighted by the evolutionary processes of developing parasitic forms," [14] and they are susceptible to many kinds of illness. Their role as a natural host to various internal organisms has not been subjected to intensive study and is, therefore, difficult to evaluate.

Mouse-borne fleas apparently serve a very minor part in the transmission of typhus [15] and possibly plague. The most spectacular development along these lines occurred in 1946 when suspicions of Charles Pomerantz, a Pest Control Operator, led to confirmation by the Public Health Service investigators that mites from house mice caused outbreaks of rickettsialpox in New York City [16]. On occasion, it is possible that house mice living outdoors may also serve as minor hosts to the tick responsible for



(Figure 2) Ranges of Mice Feeding at Each Feeding Point Traced by Coloring the Food
From Studies by Bureau of Animal Population, Oxford University

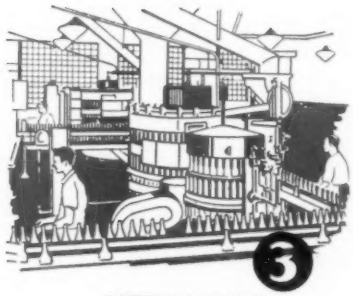
WAREHOUSE 1

Chocolate moths
Cadelles
House flies
Fruit flies
Roaches
Ants
Silverfish
Crickets
Cheese skippers and mites

2 FOOD PROCESSING PLANT

pick your pests

Spiders
Scorpions
Hornets
Gnats
Mosquitoes
Wasps
Box elder bugs
Clover mites
Confused flour beetles
Rust red beetles
Granary weevils
Rice weevils
Saw-toothed grain beetles
Spider beetles
Angoumois grain beetles
Mediterranean flour moths
Meal worms
Cigarette beetles
Drugstore beetles
Grain mites



3 BOTTLING PLANT

*

***Pyrenone*-base insecticides control them all — yet they're non-toxic to humans!**

Insecticides based on Pyrenones are *doubly economical* for pest control around foodstuffs —

- They are effective at economical concentrations against an extremely wide range of insects.
- Their combination of safety and convenience makes shorter work, faster work of insect control.

Pyrenone-based *area-type* sprays provide fast, positive knockdown and kill . . time-saving convenience . . . freedom from toxicity, skin irritants and objectionable odors. Pyrenone-based *residual-type* sprays combine safety, effectiveness, and long-lasting protection to a greater degree than any other insecticide we've tested.

**Reg. U.S. Pat. Off.*

If you'll tell us briefly what your food insect control problem is, we'll be glad to give you further information about Pyrenone-type insecticides.

U.S.I. INDUSTRIAL CHEMICALS, INC.
60 East 42nd Street, New York 17, N. Y.
Branches in all principal cities

In Canada: Standard Chemical Co., Ltd., 99 Vanderhoof Avenue, Leaside, Toronto 17, Ontario

the spread of spotted fever. Also, it has been demonstrated that laboratory mice may acquire tularemia through their fondness for bedbugs infected with the disease. Mange and certain epizootics occur among field mice and also at times affect house mice. [5] Some are found partially naked and smooth-skinned. Numerous specimens of blind and partially blind mice have been captured during a succession of years in one locality.

These rodents no doubt play an important part in the transmission of various Salmonella bacteria responsible for several forms of food poisoning to man. [17] While only about 1% of all rat and mouse excreta contains the organisms, considerable potential contamination of this nature exists because of the abundance of such rodents living in or near human foods and food handling equipment. Organisms of *Salmonella typhi-murium* and *Salmonella enteritidis* have both been isolated in house mice and are known to produce serious illness and some deaths to man, although the mice themselves sometimes exhibit resistance or immunity. For these and other reasons, culture of such bacteria known as "rat and mouse virus" are not recommended as measures for biological control of the rodents.

House mice have been incriminated as a reservoir for the virus *lymphocytic choriomeningitis* Some evidence also associates the rodent with bacillary dysentary, rabies, swine erysipelas, and infectious hepatitis. It is quite probable that they may at times transmit a number of other diseases of mankind.

Conclusion

From the studies conducted to date, it is apparent that house mice are not the insignificant creatures most persons believe them to be. In fact, their seeming unimportance constitutes a contributing reason for the abundance of these deceptive pests. Small though they may be, the members of this species represent a constantly changing, living, dynamic force capable of erupting into surprising numbers within short periods of time. Their accumulated widespread damage and relationship to diseases makes the need for better control a matter of considerable importance.

References Cited

(1) SCHWARTZ, E. and H.
1943. The wild and commensal stocks of the house mouse, *Mus musculus Linnaeus*. Jour. of Mammalogy, Vol. 24, No. 1.

(2) GARLOUGH, F. E. and SPENCER, D. A.
1944. Control of destructive mice. Conservation Bulletin No. 36, U. S. Fish and Wildlife Service, U. S. Dept. of the Interior.

(3) ANTHONY, H. E.
Field book of North American mammals. Knickerbocker Press, New York.

(4) LAURIE, E. M. O.
1946. The reproduction of the house mice, *(Mus musculus)*, living in different environments. Proceedings of the Royal Society, Vol. 133, London.

(5) PIPER, STANLEY
1928. The mouse infestation of Buena Vista Lake Basin, California. Calif. Dept. of Agriculture Bul. Vol. XVII, No. 10.

(6) HALL, E. R.
1927. An outbreak of house mice in Kern County, California. Univ. Calif. Publ. Zoology, Vol. 30, pp. 189-203.

(7) BARRETT-HAMILTON, G. E. H.
1916. British mammals. Part XIX and XX, pp. 601-664.

(8) ELTON, CHARLES
Voles, mice and lemmings. Bureau of Animal Populations, Oxford University, Cambridge, England.

(9) MILLS, E. M.
1947. House mouse control with poisoned baits. Mimeographed leaflet of U. S. Fish and Wildlife Service, U. S. Dept. of the Interior.

(10) SOUTHERN, H. N.
1946. Rodent mail. Issued by Infestation Division, Ministry of Food, London, England, Vol. 2, No. 7.
1945. The control of house mice in corn ricks. Bureau of Animal Population, Oxford University, Cambridge, England.
1945. The normal daily range of house mice. Bureau of Animal Population, Oxford University, Cambridge, England.
SOUTHERN, H. N. and LAURIE, E. M. O.
1946. The house mouse in corn ricks. Journal of Animal Ecology, 15: 134-149.

(11) SPENCER, H. J.
1949. Laboratory reports, U. S. Fish and Wildlife Service, U. S. Dept. of the Interior.

(12) SCOTT, J. P.
1944. Social behavior, range and territoriality in domestic mice. Proc. Indiana Acad. Science, 53: 188-195.

(13) ODERKIRK, G. C.
1936. House mice: Their prevention and control. Extension Bul. No. 211, Purdue University, West Lafayette, Indiana.

(14) SNELL, G. D. and Others of the Jackson Memorial Laboratory
1941. Biology of the laboratory mouse. The Balkiston Co., Philadelphia.

(15) COLE, L. C. and KOEPKE, J. A.
1946. A study of rodent ectoparasites in Mobile, Alabama. Public Health Reports, Vol. 61, No. 41.

(16) HEUBNER, ROBERT J. et al.
1947. Richettsialpox — a newly recognized rickettsial disease. V. Recovery of Rickettsia akari from a house mouse *(Mus musculus)*. U. S. Public Health Reports, Vol. 62, pp. 777-780.

(17) WELCH, H., OSTROLENK, M., and BARTRAM, M. T.
1941. Role of rats in the spread of food poisoning bacteria of the salmonella group. American Journal of Public Health, Vol. 31, No. 4.

Latest Laravacide Log Available

Volume XI of The Larvacide Log, a scientific bulletin on commercial fumigation, issued annually by the Insecticide Division, Innis, Speiden & Co., 117 Liberty Street, New York 6, N.Y., is now available to anyone writing for a copy.

A 34-page bulletin, The Larvacide Log, discusses the use of Chlorpicrin in agriculture and also deals with new developments in commercial fumigating. It contains scientific data compiled for the convenience and reference of the research worker.

Calif. Rodent Bulletins

California Agricultural Experiment Station, Berkeley, Calif., has issued a new bulletin, No. X 142, on "Control of Rats and Mice." Another bulletin, No. X 138, is titled "Control of Field Rodents in California."

New Hudson Catalog

H. D. Hudson Mfg. Co., Chicago 11, Illinois, is offering, free of charge, its new catalog showing the complete Hudson line of Peerless Super - Power Sprayers. If you would like a copy of this 20-page, illustrated catalog, write Hudson direct.

Stauffer In Houston

Stauffer Chemical Company has announced the construction of a new insecticide manufacturing plant at Houston, Texas, which will serve as another link in Stauffer's chain of agricultural chemical plants in the Southern states.

What More Do You Want in Termite Treating Chemicals?

If you're looking for more satisfactory materials to use in termite control operations, look at **Penta** Preservative.

PROVED by actual use

Penta is effective—proved by years of test and thousands of actual jobs.

CLEAN no offensive odor

Penta is clean, virtually odorless. Fact is, any noticeable odors can be eliminated by proper choice of petroleum solvents.

• IT'S CERTAIN • IT'S CLEAN •

IT'S CLEAN

PENTA PRESERVATIVE

IT'S CERTAIN

• IT'S CERTAIN • IT'S CLEAN •

SAFE no harmful effects

Penta is safe—non-irritating to most individuals working with it, and treated wood is harmless to all humans and animals.

EASY to use as directed

Penta is easy to use—as a spray, to swab on wood, or as a soil poison for a termite barrier.

Write us for full details about **Penta** Preservative and how you can use it to build your business and your profits.

TRADE CHAPMAN MARK

CHAPMAN CHEMICAL COMPANY

752 DERMON BUILDING • MEMPHIS 3, TENNESSEE

How Far Will a Mouse Travel To a Poisoned Bait?

J. T. EMLEN, JR.
Department of Zoology
University of Wisconsin

gives one answer

IT IS common knowledge that a house that has never had mice in it may suddenly become infested, and that once the mice are noticed, they will be seen repeatedly and in all probability increase as the months pass. When this happens it is generally assumed that the mice initially came in from another building in the neighborhood, perhaps over a considerable distance, and that the continuing signs are produced by the same individuals who, once having reached a suitable place to live, have made themselves at home and have settled down to live and multiply. It must not be forotten, however, that this interpretation is an assumption, and that we actually know very little about the home attachments and wandering tendencies of these pestiferous sharers of our boards and lodgings. If we knew more about how mice got to a building in the first place, how much they moved around after they were once established, and the nature of the circumstances which set them on the road again, we would be in a much better position to tackle the problem of mouse control intelligently.

There are some who would say that our curiosity in these matters is purely academic, and that it is just as easy to set out traps or poison without knowing exactly what we are doing. Of course it is a simple matter to kill a few mice; any householder or restaurant proprietor can do that if he isn't afraid to handle poison or traps. But the modern PCO is different and must make every effort to set high professional standards. The average storekeeper is impressed with the sight of a dozen dead mice each week and a fifty per cent reduction in property damage. But the modern PCO can do much better than that if he knows something about the animal he is pursuing. As the public learns this, it will demand better performance, and the callous operator will find himself left outside.

Picture by Tom McHugh

The distance that a mouse wanders from its home base in the course of its daily activities is of basic concern to the PCO. If modern rodenticides like 1080 mean almost certain death for every mouse that drinks, and this is the case, the real problem becomes one of poison distribution; a method for getting poison to every mouse in the building. If an animal has adequate food and water within ten feet of home, will he wander twenty feet to test out a new and strange drinking fountain? It will be some time before we get a complete answer to this vital question, but anything we can learn about these animals now, their activities and their peculiar habits, will fit us to devise the most appropriate techniques for each new job that is brought to us.

The problem of answering the basic question of how far a mouse normally wanders from its home base is not easily solved. Before we can say that it is the same individual mouse which reappears night after night by the kitchen cupboards, we must catch him and

The work on which this article is based was supported in part by the Research Committee of the University of Wisconsin Graduate School from funds supplied by the Wisconsin Alumni Research Foundation.

PUT THESE ORTHO PRODUCTS TO WORK FOR YOU

ORTHO PRODUCT	CONTAINS	FOR CONTROL OF	HOW PACKAGED	
			Sizes	No. Case
ISOTOX Concentrate... dilution with odorless kerosene carrier. No emulsifier — spray deposit non-visible, non-gummy	20% Lindane Formulation	Many household and building pests: flies — including DDT-resistant strain, roaches, ants, clothes moths, carpet beetles, silverfish, bedbugs, mosquitoes, gnats, spiders, certain other similar pests. Use as a multi-purpose pest control spray	1-gal. bottle 5-gal. drum 50-gal. drum	4
ISOTOX Dairy Spray and ISOTOX Wettable No. 250... wettable powders for water dilution. Contain wetting, spreading agents. Finely ground, mixes readily, stays in suspension	25% Lindane Formulation	Flies, ants, roaches in *dairy* and livestock barns, creameries, milk sheds and milk processing plants. Certain pests on dairy and beef cattle, hogs, horses, sheep. Many plant pests	1-lb. can 4-lb. can 20-lb. pail	12 4
ISOTOX Liquid Dairy Spray... water dilution	20% Lindane Formulation	Same *dairy* insect control as above	4-oz. bot. Pint bot. 1-gal. bot. 5-gal. drum	24 12 4
PEST-B-GON Spray... water dilution	25% DDT Concentrate	Residual spray for barns and other buildings: flies, fleas, mosquitoes; also such plant pests as thrips, caterpillars, bettles, leafhoppers	1 gal. can 5 gal. drum 50-gal. drum	4
PERSISTO Wettable... water dilution	50% DDT	Same as PEST-B-GON Spray above. Also livestock pests: lice, hornflies and certain other flies on cattle; sheep ticks on sheep; flies and lice on hogs	4-lb. bag 6-lb. bag 50-lb. bag	12 8
ORTHO-KLOR Sprays... use undiluted or with water depending on formulation	Chlordane	Ants, grasshoppers, crickets, thrips, certain others	1-gal. 5-gal. 50-gal.	4
ALLTOX Sprays... water dilution	Toxaphene	Ants, flies, aphis, grasshoppers, crickets, red spider mites	1-gal. bot. 5-gal. drum 50-gal. non-returnable steel drum	4
ANT-B-GON Ant Poison... for use in many types of feeders. (West Coast only)	0.2% Sodium Arsenite plus sweetening material	Argentine and sweets-eating ants	30-gal. returnable drum	
TERMCO Wood Guard... use undiluted for uses other than weed control. (West Coast only)	0.1% lindane, 2.0% DDT, 4.4% pentachlorophenol, 0.6% other chlorophenols, 90% petroleum oils	Wood and soil termites, wood-boring beetles, wood-rotting fungus; weeds along fence rows, driveways, walks, etc.	5-gal. drum 50 gal. returnable steel drum	

ORTHO Weed Control... { **WEED-B-GON 64 (Amine 2,4-D), ESTERCIDE 330 (Ester 2,4-D), ESTERCIDE T-2 and ESTERCIDE-T 245 (Esters of 2,4,5-T), TRIOX (Arsenical Weed Killer, Soil Sterilizer).**

ORTHO SCIENTIFIC PEST CONTROL REG. U.S. PAT. OFF.

CALIFORNIA SPRAY-CHEMICAL CORP.

Home Office: Richmond, Calif.

Field Offices Throughout U.S.A.

ORTHO, ISOTOX, PEST-B-GON, PERSISTO, WEED-B-GON, ANT-B-GON, TERMCO, ESTERCIDE, TRIOX, TM'S REG. U. S. PAT. OFF.

tag him in some distinctive way. Before we can decide whether it is the same kitchen resident which scurries around the clothes closet in the early morning hours, we must devise some way of getting our hands on him again and checking his identification tag. Evidence on one or two individual mice, furthermore, cannot do more than tell us what happened in those few isolated cases. Many records are needed before generalizations can be made and it is the job of the professional research worker to get just such information for the householder and the pest control operator.

Studies of Movement

Special studies of the movements of individual mice have been made at the University of Wisconsin during the past two years. Most of these studies were made in two large frame buildings which housed experimental guinea pigs, rats and rabbits used in research programs at the university. Large numbers of wild house mice found ample supplies of food and shelter in these buildings and provided an excellent source of material for a study of individual movements. A large number of wooden box traps which could catch and hold a live mouse without injury were set along the walls and under the cages in these buildings. The traps were set three nights out of each week and an average of from 20-30 mice were taken from the traps each morning. After an examination of each animal and a recording of its sex and age a number was assigned to it. The ten toes of the hind feet and the eight toes of the fore feet provided a convenient means of marking the animals individually. With a pair of sharp nail clippers or scissors the terminal segments of the toes were removed in various combinations so that each animal wore a distinctive code number which could be quickly read by the operator should the animal be recaught subsequently. All mice were, of course, released at the exact spot where they were caught.

Within a few days of this intensive trapping, marked individuals began to reappear in the traps, and by the second or third week large numbers of these animals were making their second or third entries on the record sheets. By the time eight months had passed a total of 1781 different mice had been handled and marked, 942 of which were recorded one or more times. Some of them became old friends and would show up week after week to have their identification checked and their exact point of capture plotted. These returning mice provided us with a considerable body of information which was used in drawing conclusions on normal cruising distances.

How Far They Travelled

Several methods for utilizing these records were attempted, but the method which was finally adopted was to measure the distance between the successive points of capture of each mouse. One thousand five hundred seventy-two such measurements were obtained. A study of these records revealed that the greatest distance moved by any single individual was 140 feet; and only six of the 1572 were taken more than 100 feet away. The average distance moved was 12 feet; 90% of the movements were less than 30 feet, and 70% were less than 10 feet. These results, with their indication of a very limited cruising range, were rather surprising to us as they probably are to members of this audience We often saw mice scamper down the hall as we came into the building; or they could be seen dashing across the hall from one room to the other as we approached. But apparently these individuals were representatives of the wandering minority who, caught away from home, were beating a hasty retreat. The majority, close to their home bases, scarcely made their presence known to the human intruders.

It might be supposed that mice recaptured within the first week would not have moved as far as those which were not recaptured until 5-6 months later, but this was not the case. House mice apparently are stay-at-homes, and once established, do not move around much without provocation. Such provocation apparently did not occur during the eight months of our study.

A few other interesting points were noted about the movements of these mice. In the building which had a larger amount of shelter available to the mice the cruising range was found to be slightly less. Males were a little more venturesome than females but the difference was slight. The average distance for the males was 13 feet; that for the females 11 feet.

It might be argued that our figures do not give a true and complete picture of the cruising range of these mice. True, it would be very nice if we could follow every movement of a representative mouse as it traveled around the building, but we know of no way of doing this. The figures that we did obtain, however, are highly suggestive. If 90% of the recaptures were made within 30 feet of the point of previous capture it might be logical to deduce that the average mouse spends about 90% of his time within an area prescribed by this distance. The fact that 99.7% of the recaptures were made within 100 feet certainly suggests that explorations of greater magnitude were decidedly unusual. Mice are obviously home-bodies and the alert pest control operator will do well to keep this in mind as he sets out his bait stations.

Baits 20 Feet Apart

During recent years, and particularly since the advent of 1080 rodenticide, water has been widely adopted as a carrier for mouse poisons. Poison water is generally set out in one of two ways: Either a large number of temporary stations are scattered about the premises, using paper cups as the containers; or, a smaller number of semi-permanent stations are put out using various types of glass or porcelain containers. With a full appreciation of the limited cruising range of the house mouse as described in this report the definite advantage of large numbers of stations can immediately be seen. It would seem at the start that poison baits should be spaced at least every 20 feet. Where mice have access to other

MOTHS make money for You!

...all day...every day...the year 'round

NEW FINGER-TIP CONTROL VALVE

NEW

MOTH·O·BLITZ

Kills moths, moth larvae, carpet beetles and certain other bugs!

MOTH-PROOFS a Year...for only a few cents

THERE IS NO "MOTH SEASON." Spring, summer, winter and fall the moth larvae grow fat on fabrics. This destruction of materials is continuous in all parts of the country... There is always a need for protection from these costly destroyers. MOTH-O-BLITZ contains Chlordane, Lindane, Tetralin and DDT ...deadly to fabric eating insects. The new, "self-spraying" safety valve opens and closes at the touch of the finger and puts an end to the hard work of moth proofing. Now—easy—effective and economical protection for clothing, rugs, drapes, furniture, blankets and furs. No objectionable odor or crystals—Will not harm delicate fabrics.

Packed 12 to a carton. One bomb moth proofs many garments for only a few pennies.....RETAILS **$1.98**

STOCK UP NOW... moths work all day, every day and can mean profits for you!

THE AEROSOL SPRAY HOUSEWIVES BUY...

It KILLS FLIES and other insects QUICKER!

NEW FINGER-TIP CONTROL VALVE

NEW

HIGH-PRESSURE Aerosol INSECT·O·BLITZ

LABORATORY TESTS PROVE *the new, High-Pressure Insect-O-Blitz to be the 100% Killer of flies.** It has been determined that the higher the pressure the *more* effective the spray. This higher pressure causes a much finer dispersion of insecticide particles which, because of their lightness, stay suspended longer and are carried by the air to every crevice and corner of the home.

Warm weather means FLIES — BUGS and INSECTS—housewife buys an insecticide for only one reason—to see these insects drop – and drop fast.

*Complete reports on these tests are available upon request.

Packed 12 to a carton..Retails $1.79

THE FLY SEASON IS ON! Order from your jobber now or write to

TETCO CO.

458 So. Spring Street, Los Angeles, California or Hobart, Indiana

sources of drinking water, as is generally the case, a much closer spacing is needed, for a thirsty mouse will in all probability stop to tank up at the nearest and most convenient drinking fountain. Force of habit is strong in animals and we can expect our mouse to go straight to his familiar drinking source unless the poisoned water is placed where it intercepts his path. The semi-permanent station has many obvious advantages from the point of view of servicing. Each station provides a source to which the mice can return on a second or third day should they miss it on the first. We have seen, however, that at least in the study here described, mice seldom change their home bases. We have good evidence furthermore, that the kill at isolated stations will do no more than depress a population, and will not progressively reduce it with time. With the new compound 42, where results depend on repeated visits to the poison source, the story might be somewhat different. But for the great majority of poisons the limited cruising range displayed by house mice indicates the desirability of a large number of baits well distributed through all infested portions of a building.

Rat Bites, Damage Heavy in Detroit

Detroit, Mich., has a rat population of at least 2,000,000, city experts estimate. These rodents, according to Dr. Joseph G. Molnar, the city's health commissioner, caused a near-record high of 117 rat bites during 1949. Ten bites have been reported since January 1, this year.

More than 65 per cent of the total of bites were inflicted on children under 10, Dr. Molnar reports. He broke this figure down in the following manner: 27 infants under two were bitten; 28 from one to four, and 18 from five to nine. Rats bit more than 45 children 10 years old or older.

Fatalities, which are best figured over a ten-year period, numbered 11, nine from Weil's disease. and, two from rat-bite fever. In the latter two cases, infants had attracted rats with the odor of milk on their dresses or bibs.

Edward D. Connor, member of the Common Council, has estimated Detroit's rat damage loss at no less than $50,000,000, while Dr. Marion Edman, Wayne University professor, has given a more conservative figure of $20,000,000. Lowest estimate has been placed at a minimum of $1 per year per person for 2,229,000 persons in the Detroit metropolitan area.

Here Are Some Unique Rat Hide-Outs

By H. H. SLAWSON

SINCE time began the rat's notorious will to live has led him to adapt himself to environment in uncounted devious ways, as every PCO knows. But is has remained for foresters employed by the Chicago Park District to discover him domiciled in hollow trees.

Cached in Tree Trunks

For years rats have been a problem around the Lincoln Park zoo in Chicago, where they particularly favor food placed for the rare birds in open air rockeries. Since poison baits cannot be used there, the park staff exterminator has had to use a .22 rifle, always after dark, when visitors have gone and the rodents roam without fear. In summer, also they flourish around beaches and picnic grounds, eating lunchbox leavings, which they raid even before revellers have departed.

The park PCO knew that the rats did not live in zoo buildings, because it was his job to keep them out. But where they hung out between meals was an unexplained mystery until an ice storm last winter damaged scores of stately oak trees in the park.

Foresters, in removing the wreakage, felled several trees from whose hollow centers numerous rats hastily scrambled. Entrance to these snug shelters, it was concluded, had been effected by tunnelling through rotten roots which led the rodents with unerring instinct to the hollowed out havens higher up.

Fur for Frigidity

Another curious instance of adaptation to environment, not heretofore reported in literature, was observed at the Chicago stock yards, where a PCO found rats with hair so long it trailed on the ground. All were discovered in meat coolers, where, it was inferred, the heavy fur coat was grown to protect their bellies as they crept along brine coated refrigeration pipes.

Signals Crossed

Still another odd instance of how a rat's home is where he finds it, comes from Chicago's magnificent Union Station, which in May observed the 25th anniversary of its opening. Soon after this great railroad terminal was put into service trouble developed in the signal system that controlled entrance and departure of trains. Lights just wouldn't work right and confusion resulted. Engineers checked everything but the trouble wasn't explained until a big brown rat was observed scurrying from the open end of a conduit through which electric cables led to the signals.

The station was still new but somehow rats had promptly found their way into these tubes, where, lacking other nest building materials, they had stripped insulation from the wires. This had caused short circuits which produced the erratic behavior of the signal lights. It was the first instance in history of rats disrupting a railroad.

Municipal health authorities refused to permit use of gas, so cyanide dust was blown into the tubes, then their openings were sealed up. This episode adds emphasis to the discussions heard often of late about the importance of rat proofing all buildings.

PCO's!

CYANAMID PRODUCTS

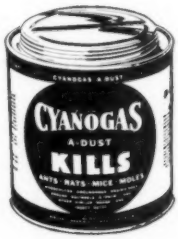
▶Improve your services ▶Increase your profits

EFFECTIVE · PROFITABLE · EASY · EFFECTIVE · PROFITABLE

EASY · EFFECTIVE · PROFITABLE · EASY · EFFECTIVE · PROFITABLE

The most generally used fumigant

in the Pest Control industry is AERO* HCN DISCOIDS, Fumigant. More dwellings, industrial buildings, railroad cars, ships and stored commodities are fumigated with hydrocyanic acid gas than with any other fumigant. DISCOIDS are thin celulosic discs saturated with commercially pure hydrocyanic acid. One-pound and forty-ounce containers readily accommodate dosage requirements. AERO HCN DISCOIDS are simply scattered from the can. No dirt or mess in application or clean-up. Where insects and rodents are a problem in enclosed spaces, DISCOIDS provide the answer.



The ideal outdoor fumigant

CYANOGAS® A-DUST is excellent for "cleaning out" rat harborages in city dumps, sanitary fills, under sidewalks, tight floors and pavements, and in fields, along ditch banks and levees. Applied effectively and economically with the handy CYANOGAS FOOT PUMP.

Not a bait . . . CYANOGAS A-DUST liberates hydrocyanic acid gas in the burrow. Rats, adult and young, breathe the gas and die quickly. No dangerous residues left to be picked up by unwary children or pets. CYANOGAS A-DUST is ready for instant use and requires no further preparation.

For small-scale, economical, indoor fumigation

CYANOGAS® G-FUMIGANT, dustless, sea-sand size granulation of calcium cyanide, liberates hydrocyanic acid gas. The same positive fumigant but of lower strength than AERO HCN DISCOIDS. Unsurpassed for easy, economical fumigation of small storage buildings needing only low dosages of gas. (Not to be used in dwellings.)

**Trade Mark*

We shall be glad to send you full information concerning any or all of these insecticides and rodenticides.

AMERICAN *Cyanamid* COMPANY

Agricultural Chemicals Division
30-W Rockefeller Plaza, New York 20, N. Y.

Branch Offices: 20 No. Wacker Drive, Chicago 6, Ill. • Brewster, Fla. • 1308 Donaghey Building, Little Rock, Ark.
111 Sutter St., San Francisco 4, Calif. • P. O. Box 808; Winchester, Va.

PROFITABLE · EFFECTIVE · EASY · PROFITABLE · EFFECTIVE

NPCA CONVENTION NEWS

"BUSINESS IS LIKE THAT" TO BE '50 THEME

Cincinnati Convention, Oct. 22-25, at Netherland Plaza Hotel

If you're interested in the business phases of pest control operations you'll want to set aside October 22, 23, 24 and 25 for attending the 18th annual convention of the National Pest Control Association convention, to be held in Cincinnati, Ohio's largest hotel, the Netherland Plaza.

The official program has not yet been released for publication, but advance news from convention headquarters reports that major emphasis will be placed on sanitation and its relation to the PCO and on office procedures, training of servicemen, salesmanship, etc. We are told there will also be technical sessions reporting latest control methods with new rodenticides and insecticides now available for PCO use.

Convention chairman, Lee C. Truman, and members of the local committee in Ohio, headed by Bob Yeager, have been holding planning meetings with increasing frequency to assure delegates that they will go away with a host of new ideas on how to increase profits by using up-to-date business and scientific methods.

465 registered for last year's convention, held in Los Angeles, California, but it is anticipated that this number will be far exceeded at the 1950 meet since most delegates will not have to travel as far to reach Cincinnati.

Registration will begin on Sunday, October 22, with the actual business sessions opening Monday morning at 9 A. M. Known as one of the hardest-working convention groups, these NPCA meetings have grown in popularity with members since there is ample time for discussion of specific individual problems which have come up during the preceding year.

Full details on the program are expected to be released in time for publication in the September issue of *Pest Control.*

Ladies Have Own Program

Mrs. Rose Ann Yaeger, chairlady of the National Lady Bugs, and Mrs. Vee Phippard are planning a program that will enable the ladies of PCOs to be busy while their husbands are attending business meetings. So, father, there's no reason to leave the Missus home.

NPCA Members May Bring Guests

For the first time in its history the 18th annual NPCA convention will be closed to non-members, unless they are invited to come by an active member of the association. This is part of the over-all program to increase the value of membership in the National Pest Control Association and to assure members that only those who are supporting the extensive work of their trade group will directly benefit from it. If you want to become a part of this group, write to Mr. William O. Buettner, executive secretary, 30 Church Street, New York 7, New York, for full details.

How to Get There

Seven railroads serve Cincinnati, Ohio: Baltimore & Ohio, Chesapeake & Ohio, Louisville & Nashville, New York Central, Norfolk & Western, Pennsylvania and the Southern Railway. If you'll be driving, this NPCA convention city is located on U. S. Highways 22, 25, 27, 42, 50, 52 and 127; Ohio Highways 3, 4, 4W, 74, 125, 264; and Kentucky Highways 8, 9, 10, 16, 17, 20, 27, 177. Cincy's airport is located in Boone County, Kentucky, 30 minutes from the heart of the city, and is served by American, Delta, TWA, Piedmont, Roscoe Turner Aeronautical and All American Airways.

Plenty to See

Cincinnati, Ohio's "Queen City", offers a host of interesting sights for NPCA convention goers who want to include a vacation in their trip to the meeting.

An Ohio River town, steeped in waterway folklore, Cincinnati has two beautiful thoroughfares — Central and Columbia Parkways. Columbia Parkway provides fine places to view the scenic beauty of the Ohio River and is a convenient way to reach Ault Park, one of the city's beauty spots. Central Parkway follows the route of the old Miami-Erie Canal, skirts the billion dollar industrial area to Millcreek Valley and is an efficient way to reach Mr. Airy Forest, a park of more than 1,300 acres containing a spectacular collection of flora native to that area.

There is also the Krohn Conservatory of flowers and plants; the Zoological Garden; the Taft Museum of paintings and art objects; the Cincinnati Art Museum; the Carew Tower, the city's tallest building with 48 floors; and Coney Island amusement park. For those looking for "after work" relaxation, there are plenty of night clubs both in Cincinnati and across the river in Covington, Kentucky.

More Insecticides Than Ever

The agricultural chemical industry has produced the largest volume of insecticides in its history during the past year, Lea S. Hitchner, executive secretary of the National Agricultural Chemicals Association reports.

Export markets for insecticides have been strong and according to the *Wall Street Journal,* insecticide consumption is on the upswing in the Caribbean area. The Commerce Department says the potential market is far greater than present use.

Not Good if Detached

You have noticed this statement on the coupon of your railroad tickets. How well that statement applies to our National Pest Control Association membership. If you become detached from the group you stand alone and **not only** are **you** weakened, but the **Association that represents your interests and the interests of your industry is weakened.**

The officers of your Association and the committees assigned to work on special projects are working hard for **you** and for the whole group.

They **can** make this a better Association. They **will** show you that the Association **is** doing a better job for **you.**

But — "Not Good If Detached" applies to each of us. Be a partner, not a detached part.

Express your views. Make constructive suggestions. We **need** every member and every member can be an **active** member.

Harold E. Jennings

President, National Pest Control Association

For full information on requirements for membership, fill in the coupon below and mail to William O. Buettner, Executive Secretary, in care of the following address:

NATIONAL PEST CONTROL ASSOCIATION

30 Church Street **New York 7, New York**

Mr. William O. Buettner, Executive Secretary
National Pest Control Association
30 Church Street
New York 7, New York

Please send me full details on requirements for becoming a member of the NPCA.

Name .....

Company .....

Address .....

City, Zone & State .....

.....

Please attach to your business letterhead

NATIONAL PEST CONTROL ASSOCIATION

Founded in 1933

▼

Officers and Directors

PRESIDENT
HAROLD E. JENNINGS
Chicago 3, Illinois
REGIONAL VICE PRESIDENTS
JOHN K. MEDOFF
West New York, New Jersey
HARLEM B. IVES
Detroit 4, Michigan
CHARLES DELK
Fresno 14, California
MARTIN MEYER
Philadelphia 7, Pennsylvania
DR. C. A. TRIMBOS
Dallas 4, Texas
HERMAN FELLTON
Atlanta 3, Georgia
EXECUTIVE SECRETARY
WILLIAM O. BUETTNER
TECHNICAL DIRECTOR
RALPH E. HEAL, PHD
SECRETARY-TREASURER
ROBERT C. YEAGER
Cincinnati 2, Ohio

DIRECTORS
THREE YEARS—1949-1952
E. ARNOLD ALDERMAN
Santa Barbara, California
A. H. BENDER
Washington 11, D. C.
ARDEN W. PRICE
Chicago 11, Illinois
STANLEY L. LIND
Chicago 4, Illinois
LEON A. MOORE
Utica 2, New York
MARK WEINTRAUB
Boston 11, Massachusetts
CHARLES SCHWIMMER
Jamaica 3, New York

TWO YEARS—1949-1951
CHARLES POMERANTZ
New York 13, New York
ALBERT M. AKERS
Cleveland 15, Ohio
JO A. ROBAR
Sioux City 17, Iowa
A. E. RITT
Philadelphia, Penn.
MYRON SEMPLINER
Detroit 26, Michigan
J. C. REDD
Jackson, Mississippi
WAYNE K. DAVIS
Berkeley 4, California

ONE YEAR—1949-1950
E. R. JENNINGS
New York 18, New York
M. H. USHER
Lincoln 8, Nebraska
ELMER A. F. KUNTZ
Chicago 41, Illinois
RAYMOND M. DEWEY
Los Angeles 4, California
W. J. O'REILLY
Minneapolis 4, Minnesota
J. EDWIN SAMETH
Newark 2, New Jersey
W. B. HILL
Memphis 1, Tennessee

CANADA
JACK RUDICK
Montreal, P. Q., Canada

PAST PRESIDENTS
WILLIAM O. BUETTNER
THOMAS C. RALEY
C. NORMAN DOLD
BARTLETT W. ELDREDGE
H. K. STECKEL
P. CALVERT CISSEL
F. E. BOHMAN
GEORGE R. ELLIOTT
THEODORE OSER
J. HARVEY STURGEON
GEORGE L. HOCKENYOS
V. H. MONTGOMERY

PEST CONTROL

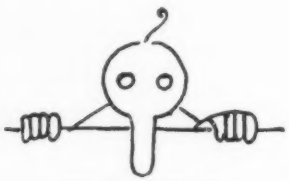
PRIMER

TRUE WEEVILS

Every industry has little ways and words which distinguish its specialists from those of other industries.

For example, when a miller or baker complains of "weevil" trouble he usually means just any species of beetle that may be infesting his products.

Actually the name "weevil" is correctly applied to only that group of beetles which is characterized by its extremely long "snout". Because of the snout these little insects are often called just that, "snout beetles".



Kilroy the Weevil

The snout is really a long extension of the head with tiny jaws on the end. With this jaw tipped snout the weevil drills tiny but deep holes in seeds, nuts, etc. She then turns about and lays eggs in the holes. With the eggs safely inside, the hole is covered by an almost invisible plug.

Larva. The eggs hatch into helpless, legless grub-like larvae which proceed to feed and grow safely on the inside of the seed.

Many Kinds of Weevils. There are many kinds of weevils or snout beetles. Some even infest wood and are confused with the powder post beetles. But the ones of interest to Pest Control operators specialize in infesting seeds, nuts and such.

Stored Foods Weevils. In grains and other stored foods there are a number of weevil species but only two are really common. Both are hard little beetles about one eighth of an inch long. Both infest whole grains or solid grain products such as macaroni. Unless closely examined the granary weevil and the rice weevil are hard to tell apart. But a few simple differences outlined below will help the beginner to separate the two.

Granary Weevil. The granary weevil is a shiny chestnut brown color. Unlike the rice weevil it has no spots of other colors on it. On the collar (prothorax) are many slit shaped pits. The granary weevil has lost its ability to fly and is therefore seldom found except where grains are stored.

Rice Weevil. The rice weevil is usually slightly smaller than the granary weevil. Its color is a dull chocolate brown with four indistinct yellow or orange spots on the wing covers. It is a strong flier and therefore may be found infesting ripening grains right in the field as well as stored grains.

Watch For Them. Both of these little fellows with long noses cause losses that run into millions of dollars each year. When you are inspecting any place that stores grain *watch for them.*

Granary Weevil

Shiny Brown Color

Pits on Pro-thorax slit shaped

No Spots of Color on Wing Covers

Rice Weevil

Dull Chocolate Brown

Pits Deep and Round

Four Orange Sopts on Wing Covers

PEST CONTROL

notebook

By Douglas Katos

HOME FOR MUD DAUBER WASP

In old Louisiana, Summer, 1950

I wasn't down here but a few days when an emergency delegation called on me to look at a house. It was a lovely little brick veneer about 15 years old with a picture-book setting of long-leaf pines, mimosa, bamboo and others in almost lush tropical beauty.

But what a nightmare for the little old lady whose home it was. Or rather I should say it was hers in title only. The nests were pasted to every favorable spot and the wasps were constantly swarming about the lawn.

In many places the window frames, door frames and siding were spread far enough from the brick to offer easy entrance to the varmints. They really took full advantage of the condition to enter and build their nests in the wall spaces.

In brick veneer houses there is usually a space between the brick facing and the wooden frame it covers. I removed a few bricks to glimpse the actual conditions. In addition to the large numbers of mud huts there was termite evidence (mud tunnels), a few smoky brown roaches and fresh traces of mice.

Something had to be done. The ladies social club couldn't convene on a lawn over which buzzed annoying wasps. So this is what we did:

1. The exposed mud nests and nesting locations were sprayed with an emulsion of Chlordane 3% and DDT 5%.

2. Chlordane Dust 6% was pumped into the spaces between brick veneer and frame.

3. For more permanent protection, all openings around the window frames and such were first filled with strips of folded tar paper and then caulking applied.

4. The bamboo hedges were lib-

(Continued on page 42)

This is the SPRAYER YOU BUILT!

STAINLESS STEEL TANK TYPE SPRAYER

• A truly professional unit, designed to provide the advantages which you need for the larger jobs where more insecticide must be used than can be handled by smaller units.

Check these features: All mechanical seals — no soldered inlets — leak-proof valve gives clean shut-off — has Koroseal washer — accurate pressure gauge with unbreakable crystal — stainless steel 2¾ gal. tank and pump — renewable hose end adapters — 5 ft. ¼" I.D. PCE oil-resistant hose — 18" PCE aluminum extension — Fan pattern spray nozzle — Knapsack type web strap.

Price: $32.50 List — $25.00 to the PCO

ORDER TODAY!

Send for our catalog of equipment and supplies for the PCO.

PEST CONTROL EQUIPMENT CO. PCE

47 West 43rd St. New York 18, N. Y.

VAnderbilt 6-5390

PRENTOX PEST-TESTED

RAX POWDER

a new rodenticide containing **WARF Compound 42**
NOW AVAILABLE FOR USE BY PCO'S

Pest Control Operators now have available a new method of rat and mouse control which shows promise of being the most effective means yet devised. Still sold only in experimental lots, but in sufficient quantities, to qualified users provided they submit reports of the results, RAX POWDER contains the new Wisconsin Alumni Research Foundation's discovery, Compound 42. Each lot is thoroughly tested in the laboratory to assure killing power on rats and mice.

Rax Powder has been under tests for four months. Cooperators report satisfactory to complete control in better than 80% of all tests. This includes both rats and mice. No primary or secondary accidental poisonings have been reported on humans, household pets or farm animals.

The use of Rax Powder in structural pest control operation offers the pest control operator a potential opportunity to place rodent control on a satisfactory service basis — something that heretofore has not been possible with the rodenticides that were available.

Write Prentiss today for complete information on Rax Powder — this new rat and mouse control product.

OTHER PRENTISS PRODUCTS FOR THE PCO

DDT • BHC
RED SQUILL
CHLORDANE • ROTENONE
TOXAPHENE
SABADILLA
PYRETHRUM

R. J. PRENTISS & CO., Inc.

110 WILLIAM ST., NEW YORK 7, N. Y.

9 SO. CLINTON ST., CHICAGO 6, ILL.

3 ...AIDS TO BETTER PEST CONTROL

Hudson Industro* Sprayer

Pest control operators find this sprayer ideal for applying insecticides at correct pressures and spray patterns for best results. Pressure up to 80 lbs. Choice of galvanized or stainless steel tank. Model shown here has 2¾ gal. cap.; also available in 4 gal. size.

Hudson Wizard* Lektrik-Spray*

The fast, easy way to spray all insecticides. Dual purpose nozzles give either wet residual spray (surface) or fine mist (space). Model shown has time switch—permits operator to place sprayer in room to be treated and let sprayer run unattended. Stops automatically at desired time.

ALL PURPOSE POWER SPRAYER

Will handle any pest spraying or sanitation problem! Model shown has 50-gal. tank; produces 400 lbs. pressure per sq. in.; delivers up to 4 gal. per minute. Also available with 30-gal. tank, producing 250 lbs. pressure per sq. in. Timken bearing wheels and pneumatic tires for easy handling.

SIGN OF THE BEST BUY

HUDSON

Tested and Proved
SPRAYERS AND DUSTERS

*Trade Mark

What are your pest control problems? For assistance, write Dr. Wm. Dickison, c/o H. D. Hudson Mfg. Company, 589 East Illinois St., Chicago, and give full details. No obligation, of course.

H. D. HUDSON MANUFACTURING COMPANY
589 EAST ILLINOIS STREET • CHICAGO 11, ILLINOIS

RODENTICIDE & INSECTICIDE INSURANCE

for

The Pest Control Operator And Allied Industries

Our Public Liability policies include essential coverage against the risks of "1080". Certificates of insurance issued to meet your requirements.

★

Other type policies, in all representative

AMERICAN STOCK COMPANIES for
Public Liability — Workmen's Compensation
Auto Liability — Products Liability
Property Damage — Accident and Health
All Allied Lines

Also
Life Insurance and all Forms of
Employee Insurance Plans

Inquiries cordially invited.

There is, of course, no obligation.

B. & D. A. WEISBURGER

1440 Broadway, New York City 18, N. Y.

A. F. C. QUALITY PRODUCTS FOR PEST CONTROL

Chlordane, oil concentrate, liquid emulsifiable concentrate, wettable powder concentrate, and ready-to-use liquids and powders.

Super Fluorex V, powerful insecticide powder

Sodium Fluoride

Poison Seeds

Pyrethrum and DDT, powders and liquids

Paradichlorobenzene

FOR EFFECTIVE RAT CONTROL

Phosphorous Paste
Rumetan (Zinc Phosphide)
Fortified Red Squill Extract and Powder
Antu and Antu Tracking Powder
Thallium Sulphate
Barium Carbonate
Arsenic White

FOR TERMITES

Orthodichlorobenzene, Creosote Oil, Sodium Arsenite Powder, Pentachlorophenol Concentrate

Write for particulars and prices

AMERICAN FLUORIDE CORPORATION
151 WEST 19TH STREET — NEW YORK 11, N. Y.

Editorial

Pest Control Chaos and War

HOSTILITIES in the Far East may or may not develop into another global conflict. But whether they do or not, it is time for the pest control industry to set up a definite plan that will determine what its members can do best toward achieving the ultimate goal. They must have men, materials and transportation to do what will be essential should the United States again be called upon to fight for the principles of freedom and democracy.

It is important that sufficient industry protection be granted by the Federal government to enable operators to provide effective service. The need for essential chemicals, trained personnel and facilities such as tires, gasoline and transportation should be realized.

The group of men that comprise this industry have an important role to play in any national emergency.

Bacteriological destruction can occur in several ways. Direct enemy action is not the only means by which disease organisms can be distributed. After an attack of any kind, normal practices become quickly disorganized, health standards drop and resistance of the human machine is lowered. The more rapidly strains of bacteria are transmitted from man to man, the more virulent those strains become. Infestations may become so acute that their combined effect soon reaches an explosive point where disease and chaos is as disastrous and of as great importance as a bacteriological attack promulgated by enemy forces.

To avoid such depredation of society it is imperative that we establish a sound national preventive pest control program, one that may be more extensive and effective than that which now exists.

Fortunately throughout World War II, Washington realized the importance of sensible pest control and bolstered its activities by assuring adequate supplies. Since VJ-Day, there have been Federally-sponsored fly, mosquito and rat control programs. Washington cannot reverse its stand in wartime and neglect to insure the continuance of this work.

But there is more that can be done with pest control operators taking a significant part. The men in this industry can form a cadre to provide efficient pest control in any and all military and civilian situations. They can constitute a nucleus upon which to build a greater pest control corps. They offer a reservoir of experience know-how on insect and rodent elimination that no other single industry group is able to provide.

With government cooperation PCOs might even set up a nation-wide look-out service to report the incidence of infestations the country over at frequent intervals.

A certain percentage of pest control men has sufficient training and high-level education to head up training programs for military and civilian personnel should the all-out effort require that some PCOs serve the armed forces.

Reports from the Korean front tell how our soldiers are confronted with rat-infested huts and are sometimes forced to sleep on flea-ridden tables. There is need for pest control. In other strategic spots United Nations sponsored crews are attempting to wipe out the malaria menace. PCO T. Roy Young, Jr. is heading up such a program in Iran.

A broad program will enable PCOs to fully use their abilities in cooperation with other groups and industries to hold infestations below the danger level. It is not our intention to promote war hysteria. But, the need for positive action by this industry to organize its facilities to be ready should be taken now, without further delay.

PEST CONTROL

NEWS

Jewish Appeal Seminar

NPCA executives, William O. Buettner, executive secretary, and Dr. Ralph E. Heal, technical director, along with Jerome Trichter, of the New York City department of health, took part in a seminar sponsored by the Pest Control Industry Division of the United Jewish Appeal of Greater New York at Hotel Statler, June 27th.

This was the third annual affair, which in previous years was in the form of testimonial dinners. In 1948 Charles Pomerantz was honored and in 1949, Nathan N. Sameth was lauded guest. For 1950 it was felt a more professional type meeting would create greater interest.

Dr. Heal spoke on "Fly Control" and Mr. Trichter talked on "The Professional Exterminator's Part in Rat Control as Viewed Through the Eyes of the Department of Health." Mr. Buettner acted as moderator for the meeting.

Purdue Needs Specimens

Professor J. J. Davis, Chief in Entomology, Purdue University, Lafayette, Ind., tells us that the following specimens are needed for next year's PCO Conference: 250 winged ants — any species, but especially carpenter ants and yellow or citronella ants; and 250 thief ants and pharoah's ants.

Any number of the above ants will be most welcome so if you can bottle some, send them to Professor Davis.

Auto Crash Kills Kinzie

Ralph H. Kinzie, age 37, died as a result of an automobile collision that occurred on June 16th as he was returning to his home in Upper Sandusky, Ohio. Accompanied by his wife, who survives him, Kinzie had been visiting relatives in Bucyrus, Ohio. He was an employee of the Central Service & Exterminating Company of Ohio.

Termites, ants, bees and mice attract wide attention in Redd Pest Control's Exhibit at the recent Home Show held in Jackson, Miss. Termites constructed actual tunnels while mice kept a merry-go-round and ferris wheels going to the delight of both children and grown-ups. Posters and plaques explaining habits, life histories and facts about insects and mice added to the display. Of approximately 90 exhibits, Redd's booth received sixth place honors.

Columbus Passes Ordinance

Columbus, Ohio, has passed a pest control ordinance requiring all operators working in the city to have a license or permit issued by that municipality's board of health. A new Pest Control Council consisting of three members has been established with H. K. Steckel, NPCA president in 1938, as its first chairman.

It is the duty of this council to conduct examinations for PCOs and their employees to determine the applicant's character, training and experience and to recommend or not the issuance of a permit. All present firms and their employees in Columbus have been granted permits by the Council, but any other person wishing to do pest control work within the city must be licensed first.

Lafferty to Lafferty, Jr.

On July 1st, O. W. Lafferty, superintendent of the Cape May County (New Jersey) Mosquito Extermination Commission retired from his post, but the Lafferty family's fight against the pest will be continued by his son, Boyd, who will take over his father's position.

The elder Mr. Lafferty began his campaigning to eliminate mosquitoes in 1916 and has served as superintendent of the commission since 1931.

AIB Welcomes PCOs

Last month we reported that J. A. Watkins, Vogel-Ritt, Detroit, had attended the special courses in bakery sanitation sponsored by the American Institute of Baking in Chicago. We have since learned that Harlem B. Ives, Rose Exterminator Co., also of Detroit, was also at that series. Similar courses were held in New Orleans and members of the Orkin Exterminating Co. of Atlanta, and Augusta, Georgia, and Little Rock, Arkansas, namely Adrian J. Gaynor, W. H. Hite, and Carl L. Whitson were present.

The next AIB Sanitation Courses are scheduled for September 10-13 in St. Louis. Registrations are now open for this session. Complete information may be obtained by writing the Department of Sanitation, American Institute of Baking, 1135 Fullerton Ave., Chicago 14, Illinois.

will never be any

THERE ~~IS NO~~ SUBSTITUTE FOR EXPERIENCE

And in fogging,

TIFA THE PROVEN APPLICATOR

Carrying Underwriters' Listing Seal

has years of experience!

5 successful years of dispensing death-dealing fog have *proven* **TIFA** more effective, faster, more economical than any other fogging method.

An outstanding record — which means added profits for you! **TIFA** is self-powered, sturdy, one-man-operated — a health necessity at resorts, in recreational areas, on garbage and fill dumps . . . an essential tool in industry!
You can depend on **TIFA** !

TIFA TODD INSECTICIDAL FOG APPLICATOR

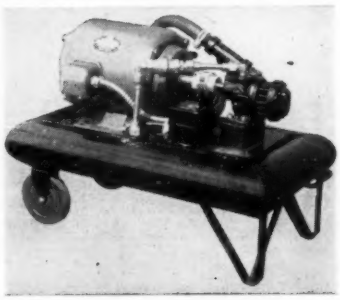
Write for new circular

A Product of

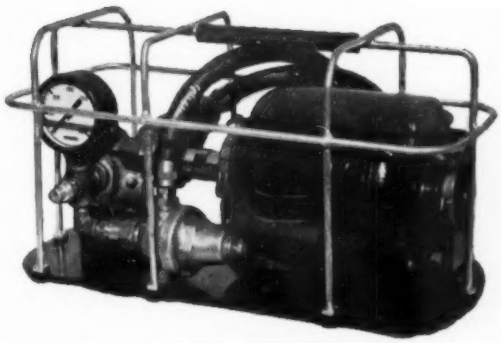
COMBUSTION EQUIPMENT DIVISION
TODD SHIPYARDS CORPORATION
81-16 45th AVE. ELMHURST, QUEENS, N. Y.

FOR TERMITE CONTROL AND RESIDUAL SPRAYING

Use America's Best Portable Power Sprayer



THE AUTOMATIC PRESHUR-MITE



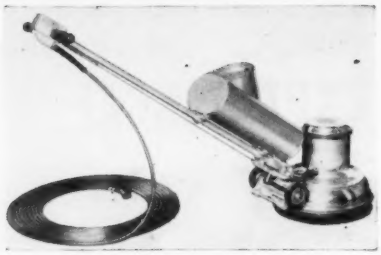
THE JUNIOR PRESHUR-MITE

Save money by cutting man-hours of work and equipment up-keep with the portable PRESHUR-MITE. 5 models to select from. Electric or gasoline powered. Weigh from 44 to 127 lbs. each. Pressures up to 225 lbs. psi and up to 5 gallons of liquid per minute. Fully equipped ready for use, priced from $132.50 to $326.50 f.o.b. Jackson, Miss. Write for further information and prices.

"The choice of the industry and operator"

EWING MANUFACTURING CO.

P. O. Box 1986 **Phone 3-0343** **Jackson, Miss.**



Kent Floor Machine

Kent Machine Has New Tank

In the May, 1950 issue of Pest Control, the above floor machine manufactured by the Kent Electric Corp., Rome, New York, was incorrectly described as the Model A91 Floor Conditioner designed for small area floors.

This machine, however, is the Kent C-15 Floor Machine which has a newly developed handle-type solution tank made of rust resisting galvanized iron. The tank has a capacity of 3½ gallons and is designed so that it will not change the balance of the machine whether full or empty.

A large opening for easy filling, and a positive shut-off valve for use when the machine is temporarily stored are additional features of the solution tank. Write the manufacturer if you would like more information.

Hardenbergh Heads NY Rat-Out

William A. Hardenbergh has been appointed by New York's Mayor O'Dwyer as consulting engineer to the Department of Health to coordinate and direct rat extermination projects of all city departments and agencies.

Colonel Hardenbergh, who is 61 years old and has served in the Sanitary Corps of the Army, the Surgeon General's Office and the U. S. Public Health Service, will have his office at 250 Church Street (not too far from NPCA headquarters at 30 Church St.). Some home relief recipients will be put to work on the rat control project, we are informed.

Weed Resistance to 2,4-D

That pest control operators may be confronted with weed resistance to 2,4-D is revealed in a recent report from the United State Dept. of Agriculture.

Suspicious of surviving Johnson grass plants in sugarcane fields treated with 2,4-D, agronomists of the USDA found that the next generation grown from the seeds of these surviving plants was twice as resistant to the 2,4-D as those of the previous generation. Johnson grass, introduced into the South as a forage crop more than a century ago, has spread widely as a weed in cane and cotton fields.

Be A Contributing Reporter

Attention *Pest Control* readers! We are asking you to become Contributing Reporters.

PCOs all over the country get married, have children, undergo operations, or have unusual experiences in their work, but we seldom hear about it until it's too late to be of timely interest.

To help us inject a little more human interest into our news pages we're asking all of you who read *Pest Control* to send us personal news items about yourself, your association, fellow PCOs in your locality, or news about progress or activities in your establishments. Give us the facts and we'll do the rest—just make sure first and last names, addresses and dates are accurate.

"Crawl Spaces" for PCOs

As every PCO knows, a crawl space is that enclosed space or spaces under the first floor of a building where there is no basement or occupancy and the first floor is some distance above the surface of the ground. A new government publication describes the effect of crawl spaces on dwellings, an analysis of causes and results, and suggests good practice requirements. This booklet should be of particular interest to termite operators. Send 15 cents to the Superintendent of Documents, Washington 25, D. C. and ask for Catalog No. HH 1.9/a:1, if you'd like to have a copy.

AMA Pesticide Committee

A committee on pesticides to study health problems associated with the use of insecticides and other economic poisons has been appointed by the American Medical Association.

Purpose of the committee is to integrate existing information on pesticides for the use of physicians and others. Objects of the committee, as stated in the AMA *Journal*, include: promotion of safe standards for use; the development of antidotal measures; the stimulation of voluntary control; the standardization of nomenclature; the accumulation and evaluation of new information; and the launching of an intensive educational program. The new committee is seeking the active cooperation and assistance of all branches of science and industry in achieving these ends.

Members of the committee are: Herbert K. Abrams, M. D., Dept. of Health, Chief, Bureau of Adult Health, Berkeley, Calif.; E. M. K. Geiling, M. D., Professor of Pharmacology, University of Chicago; Albert Hartzell, Ph. D., Boyce Thompson Institute for Plant Research, Yonkers, N. Y.; Culver S. Ladd, B. Sc. Council on Foods and Nutrition, Silver Springs, Md.; Arnold J. Lehman, M. D., Food and Drug Administration, Federal Security Agency, Washington, D. C.; S. A. Rohwer, Assistant Chief, Bureau of Entomology & Plant Quarantine, USDA, Washington, D. C.; S. W. Simmons, Ph. D., Chief, Technical Development Services, Communicable Disease Center, U. S. Public Health Service, Savannah, Ga.; Justice C. Ward, Chief, Pharmacology and Rodenticide Section, Insecticide Division, USDA, Washington, D. C.; Torald Sollman, M. D., Cleveland, and Bernard E. Conley, R. Ph., Chicago, secretary of the committee.

Essential Oils Price List

Fritzsche Brothers, Inc., 76 Ninth Ave., New York 11, N. Y. has just issued a new price list on its essential oils and perfume bases. Copies are available free of charge to those who buy in wholesale quantities.

Warfarin For Consumer Sale

Wisconsin Alumni Research Foundation announced early in July that warfarin (formerly known as Compound 42) has been released for general consumer sale. The announcement states that the chemical has proved to be a remarkably safe and a most effective means of rodent control in hundreds of laboratory and field tests.

Warfarin is protected by a patent owned by the Wisconsin Alumni Research Foundation. S. B. Penick & Co., 50 Church St., and R. J. Prentiss & Co., 110 William St., both of New York city, are two firms which handle the distribution of the rodenticide in various fields.

Riess Into Own Bldg.

Riess Products Co., Edmonton, Alberta, Canada, has moved from its former address at 9916 102 Avenue to Rear 9302 111 Avenue where it now has its own building.

W.A.R.F. 42 Now Called "Warfarin"

The coined generic name "warfarin" has been adopted by various agencies for the anticoagulant chemical previously known to the pest control industry as Compound 42, or W.A.R.F. 42, according to a recent statement by Dr. S. A. Rohwer, chairman, Interdepartmental Committee on Pest Control, Bureau of Entomology & Plant Quarantine, USDA.

The term "warfarin" should be used as a common name. The first letter should not be capitalized except when capitalization is in keeping with accepted usage for common names. The pronunciation is wor'fo rin.

The rodenticide warfarin was first synthesized by Dr. Miyoshi Ikawa in the laboratories of Professor Karl Paul Link at the University of Wisconsin, Madison, and reported in 1944.

Use of warfarin as a rodenticide involves concentrations of .025% to .010% on the dry substance basis. At this concentration household pets have to eat fairly large quantities of the poisoned bait over a period of days before fatal hemorrhage occurs. By giving Vitamin K and a normal diet the hemorrhaic condition can usually be corrected if the exposure to the anticoagulant has not been too long, Professor Link reports. He also states that "If obvious care and precautions are used in the handling of warfarin concentrate powders, or warfarin baits (avoiding oral intake), the risk to the handler is very slight."

Toxaphene Plant to be Built

Hercules Powder Co., Wilmington, Delaware, recently announced plans for the construction of a second unit for the manufacture of toxaphene, the chlorinated-camphene insecticide used in killing cotton boll weevils and other crop and livestock pests, but not recommended for household use.

The new plant will be located at Hattiesburg, Mississippi. The company's other plant is at Brunswick, Georgia, and has been in operation since 1947.

★ **It's Tip-proof!** The special flared skirt fits flush to floor all-around . . . will not tip even if a rat steps on the edge of the container.

★ **It's Tested and Approved!** Tests show no signs of leakage or seepage after 18 days. Specifications call for only 3 days!

★ **It's Seamless!** One piece construction, pressed into form under tons and tons of pressure from special water-resistant stock. Holds 3/5 fluid ounces.

★ **It's Sturdy!** Withstands 30 pounds of weight without crushing.

★ **It's Easy to Pick Up!** Flexible corrugated skirt gives positive grip, yet firmness of container itself prevents distortion and spilling.

★ **It's a Time-Saver!** Containers separate easily even in extreme temperatures. Need no fastening down . . . ready to use just as they come from the box.

★ **Built-in Safeguards!** Distinct in appearance. No mistaking it . . . in shape . . . in color . . . and warning . . . poison and skull and cross bone symbols all over it.

★ **Meets Rigid Specifications!** "Rat Jiggers" meet all specifications of Federal agencies and National Pest Control Association.

*Trade Mark Patent Pending

Packed 5000 to a case
Samples and full information are yours for the asking

UNIVERSAL
PAPER PRODUCTS COMPANY
380 Lexington Avenue • New York 17, New York

Universal Paper Products Company
380 Lexington Avenue
New York 17, New York

Please send samples and full information.

Print Name .....

Street .....

City ..... Zone .... State .....

19H2

Parathion Respirators

A three-page release on recommended respirators for use when handling insecticides containing parathion has been prepared by the USDA's Interdepartmental Committee on Pest Control. It explains some of the hazards encountered when using this insecticide in either dust or mist form and suggests some of the precautions which must be taken. Copies are available upon request from the Bureau of Entomology & Plant Quarantine, or Insecticide Division of Production and Marketing Administration, Washington 25, D. C. Ask for the release entitled, "Respirators for Field Use for Inhalation Protection From Dusts or Mists of Parathion Insecticides."

Control of Odors Booklet

A concise, readable presentation of the problem of undesirable household and industrial odors together with practical methods for their control, is given in a new circular, "Control of Odors," just published by the National Bureau of Standards. This pamphlet is based on research conducted at the Bureau and on critical consideration of the extensive technical literature on odor control.

Send 10 cents for a copy of this National Bureau of Standards Circular 491, "Control of Odors," to the Superintendent of Documents, Washington 25, D.C.

DDT For Termite Control

DDT has now been added to the list of effective chemicals that can be used for termite control work, according to recent findings of the U. S. Department of Agriculture.

The testing of DDT for termite control started in 1943, shortly after the chemical was developed for war-time use by Bureau of Entomology and Plant Quarantine scientists at their Orlando, Florida, laboratory. Experiments show that 5% DDT in No. 2 fuel oil gives protection to wood in contact with soil for five years. Further research is necessary to find out just how long DDT will continue as a barrier against termites.

For Rat Odors

Charles V. Sparhawk, president of Sparhawk Co., Sparkill, New York, has introduced a new product which he claims will destroy the odor of dead rats. Called "Skunkadora," the product is sprayed between walls and partitions where dead rats lie. It is claimed the spray material will sink down until it reaches the carcass at which time it stops all odors of decomposition.

U. S. T. Moves N. Y. Office

United States Testing Co., one of the largest independent commercial testing and research organizations, has moved its New York offices to the McGraw-Hill Bldg., 330 West 42nd St. Thomas C. Ridgway of the company's Service Division will manage the new office. Main laboratories and company offices are located in Hoboken, N. J.

A Pound of (SURE) Cure

Larvacide

CHLORPICRIN

An ounce of prevention is fine . . . but what about those situations in which it's too late for preventive measures? America's 'blue-chip' PCO's recommend LARVACIDE, the penetrating tear gas fumigant, for sure cure of rat control problems. The handy one pound cans of LARVACIDE are standard equipment wherever they go, for they never know when they'll need this all-around, fast-acting fumigant.

Building fumigation with LARVACIDE can be done with light dosages—¼ lb. per 1000 cu. ft., or, in some cases 2½ lbs. per 1000 sq. ft. LARVACIDE drives rats out of their hiding places to die on the open floor. Fumigated buildings are easily aired. LARVACIDE is also recommended for burrow treatment outside infested buildings. Treated burrows usually fall in from disuse because of the tear gas that remains within them.

Carry the SURE cure on YOUR jobs—in handy one-lb. cans. It's the can that says 'can-do' to rat control.

INNIS, SPEIDEN & CO.

117 Liberty St., New York 6, N. Y.

Boston Cincinnati Chicago
Cleveland Philadelphia Omaha

The IDICO SPRAYER

IS DOING A TERRIFIC JOB FOR P. C. O's. —

It is Ideal for Service Work with All Types of LIQUIDS — OILS or EMULSIONS

The Idico Sprayer develops terrific pressure with finger tip control. It comes equipped with interchangeable nozzle for **Stream** or **Spray**.

ORDER YOURS TODAY

$6.95 each Delivered

$78.00 doz.

IDICO PRODUCTS CO.

1 West 125 St. New York 27, N. Y.

5 YEAR WRITTEN GUARANTEED MOTH CHEK MOTHPROOFING

A Detroit hotel buys a $1248.00 job of MOTH-CHEK moth proofing for carpeting from one P.C.O. . . . Investigate your potential profits from jobs like this.

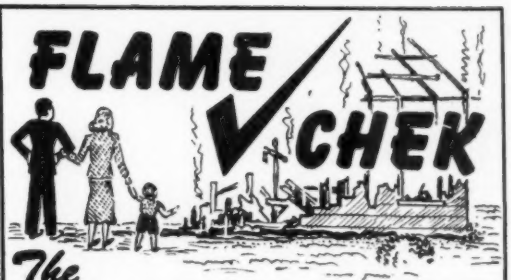
MOTH-CHEK is ODORLESS, COLORLESS, STAINLESS. SAVE TIME, MONEY and WORRY.

Every job is guaranteed for 5 years.

PROVEN PROFIT MAKERS FOR P. C. O.'s

WRITE FOR SAMPLES AND DETAILS

FLAME CHEK



The amazing liquid that STOPS the spreading of Flames

Profits . . . More Profits . . . Extra Profits . . . Any way you look at it. One P.C.O. "FLAME CHEK"ED an industrial plant for $3000. Another "FLAME CHEK"ED an auditorium for $900. Can you use "extra" business like this? FLAME CHEK flameproofs rugs, drapes, upholstery, paper, etc. Applied by Spraying. Approved by Fire Departments in 25 big cities and 3 states.

Every job is Extra Profit!

CHEK PRODUCTS CO., INC. 31 NASSAU PLACE, EAST ORANGE, N. J.

YOU'LL
SEE BETTER
BREATHE EASIER
BE SAFER
FEEL BETTER
AND
WORK BETTER

....With the ACME Full-Vision Gas Mask

Get the complete facts today and see how much MORE Acme offers you against the hazards of aerosols, dusts, insecticides and fungicides.

ACME PROTECTION EQUIPMENT COMPANY

3037 West Lake Street, Chicago 12, Illinois

FOR CUSTOMER SATISFACTION

IN OVER THE COUNTER SALES AND SERVICE

MAGIKIL	JELLY ANT BAIT Traps and Tubes
MAGIKIL	ANT KILLER KITS ANT DUST Refills and Bulk
MYSTIKIL	ROACH KILLER KITS ROACH POWDER Refills and Bulk
BORERKIL	In Tubes

Each product designed for easy, economical, and effective use—attractively packaged to bring fast over the counter sales.

Performance of each product unconditionally guaranteed. Whether used in service work or sold retail you are assured of customer satisfaction. For service work and retail profits, they can't be beaten!

LETHELIN PRODUCTS CO., INC.
15 MacQuesten Parkway, South
Mount Vernon, New York

Innis, Speiden Is Distributor for Fumigun

Innis, Speiden & Co., manufacturers of Larvicide and Iscobrome for soil fumigation and Iscomist Aerosols for greenhouse use, has been appointed distributors for Fumigun, a hand operated injector for soil fumigant application.

Constructed of brass, phospor bronze, stainless steel, and noncorrosive aluminum, the Fumigun has no gaskets or packings. Two soil tubes are furnished, one for emitting injections to a depth of 3½ inches, and another for depths of six inches.

The injector is equipped with a fine mesh wired cloth strainer which prevents grit and foreign substances from getting into the unit. All of its three quart liquid capacity can be dispensed before refilling and can be delivered in dosages from 1 to 10 cc per shot, the manufacturers say. The Fumigun weighs 10½ lbs.

Application information, soil fumigation techniques and prices for the Fumigun are available from Innis, Speiden, 117 Liberty St., New York 6, N. Y.

'Damage Key' Pictures by Coffin

The marvelous pictures included with Dr. Harvey L. Sweetman's article, "Identification of Pests by the Damage They Do," which appeared in the June issue of *Pest Control*, were taken by Robert L. Coffin in Amherst, Massachusetts. It takes a man of rare photographic talent to make such highly magnified studies and Mr. Coffin is deserving of much credit for his part in Dr. Sweetman's damage key.

Three Ortho Lindanes

Isotox - lindane, residual fly control approved for dairy barn use, is now available in three forms from the California Spray-Chemical Corp., Richmond, California. It may be obtained as a 20% lindane liquid concentrate, a 25% lindane wettable powder, or as a 1% lindane animal dust, a company release reports.

1080 for Ground Squirrels

John Finley, district agent for the Fish & Wildlife Service, stationed in the state of Washington, reports that 1080 has proved itself 95 per cent effective against ground squirrels. He said tests of the poison promised eventual control of the ground squirrel in the Eastern Washington wheat belt and that the results were also valuable from a health standpoint since some squirrels of Spokane and Stevens counties have been found to carry bubonic plague.

Cal. Spray Expands Research

California Spray-Chemical Corporation, Richmond, California, has just announced an expansion program for laboratory and field research on agricultural pest control chemicals for 1950 and 1951. New field laboratories have been established at Janesville, Wisconsin; Uvalde, Texas, and Orlando, Florida, supplementing laboratories previously established in various parts of the country.

GET ON THE BAND WAGON

Follow the Crowd With PER-MO Profits

★ **Per-Mo 5 Year Guarantee Moth Proof Liquid**
Packed in Pints, Quarts, ½ gals., gals., and 5 gal. containers

★ **Per-Mo Flameproof Liquid**
Packed in Gallon containers or in Drums.

★ **Per-Mo Rat & Mice Liquid**
Packed in 8 oz. bottles or in gallon containers.

★ **Per-Mo Rat Bits Made With Red Squill (Fortified)**
Packed in 4 and 16 oz. containers or in Bulk.

★ **Per-Mo Rat Paste, Made With Red Squill (Fortified)**
Packed in 4-8-16 oz. jars, and in Bulk.

★ **Per-Mo Rat Paste, Made With Antu**
Packed in 4-8-16 oz. jars, and in Bulk.

★ **Per-Mo "Chek" Deodorant**
Packed in Quarts or in Gallons.

WE WILL SHIP YOU A GENEROUS SAMPLE OF ALL THE ABOVE PRODUCTS FOR $5.00 EXPRESS PREPAID.
Send Check or Money Order.

PER-MO
STANDS THE TEST
IT'S BY FAR THE BEST

★ All Per-Mo Products Packed Under Your Private Label If Desired. Write Today . . . Full Particulars First Letter

PER-MO PRODUCTS COMPANY
3602 Woodland Kansas City 3, Mo.

WHEAT
Rechargeable Spotlight

- 1000 hrs. operation
- 25,000 candle power
- 2500 foot powerful light beam
- 6-12 hr. service depending on power used
- Non-spill construction
- Weighs only 95 ozs.
- Durable lens and case
- Polished chrome top and lens guard

Model 264

Easy to use Wheat Spotlight

Prices: WHEAT Rechargeable Spotlight, $25.00
Recharger, $10.00
Automobile Cigar Lighter Charger, $3.00
f. o. b. Cleveland, Ohio

SUPERIOR EQUIPMENT COMPANY
3204 St. Clair Ave. Cleveland 14, Ohio

PLASTIC PINTS

Put an end to bottle breakage with plastic pints. They won't break, chip, shatter, burst in winter if emulsions freeze, soften or deteriorate. Mighty good looking, too, with smart professional appearing plastic caps. Eliminates spilling in your kit or on your customer's premises. Good? They're unbeatable — and UNBREAKABLE!

48c each in gross lots, net.
54c each in 6 doz. lots, net.
60c each in dozen lots, net
75c each in less than doz. lots, net.

PLACE YOUR ORDER NOW!

Check Your Needs!

GET OUR CATALOG AT ONCE! IT'S FREE!

PCE
Pest Control Equipment Co.
47 W. 43rd St. New York 18, N. Y.
VAnderbilt 6-5390

Use **CRE-O-TOX**
for TERMITE CONTROL

The Termite Chemical with a guarantee.

12½ to 1 CHLOROPHENOL "PLUS"
Concentrate saves freight charges.

★

Practically Stainless and Odorless when dry.

★

Write for details of our
Dealer Cooperation Plan

CRE-O-TOX CHEMICAL COMPANY
P. O. Box 5026 Memphis 12, Tenn.

Pioneers in the use of chlorinated phenols for termite control.

There's Extra Business for you in

Custom Spraying

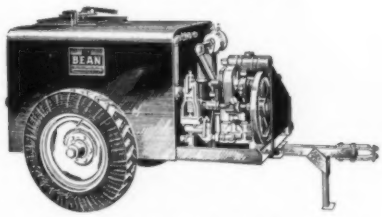
with John BEAN **SPRAYERS**

There is a great market for a custom spraying service in your community. A market that offers opportunities for you. Little investment is needed. No special training of operators required. Operating costs are low, profit margins good.

Write for free Custom Spraying booklet.

Look at all the extra jobs you do

- Spray shrubbery, fruit and shade trees, kill weeds in lawns, keep stables and barns pest-free.
- Rid homes, resorts, industries or whole communities of flies and insect pests.
- Brush control on public utility right-of-way.
- These and many other profitable jobs are building profitable business for the Custom Sprayer.



Full Line of John Bean Sprayers Meets Your Needs!

All types of power sprayers are in the John Bean line, and there's one that's right for the jobs you'll do in your community. Write for free John Bean Custom Spraying booklet today.

John fmc BEAN
LANSING MICHIGAN
DIVISION OF FOOD MACHINERY AND CHEMICAL CORPORATION

ORGANIZATION NEWS

Heal Talks Flies to E. Pa. PCA

Dr. Ralph E. Heal, NPCA Technical Director, presented the feature discussion, on fly control, at a regular dinner meeting of the Eastern Pennsylvania Pest Control Association held June 15, at the Robert Morris Hotel, Philadelphia. Forty-one members and guests were present.

The group voted to send to the U. S. Fish and Wildlife Service, as requested, 400 copies of the Antidote Pamphlet prepared recently by members of the association.

Next meeting will be held in September at Wilmington, Del., at which time members will discuss the idea of holding more meetings outside of Philadelphia.

NY PEA Studies Office Forms

Professional Exterminators Association, Inc., of New York, met June 12 at the Museum of Natural History to devise standard contract and service report forms. The group also discussed their next short course and the subject of cooperative purchasing.

Members voted not to meet during July and August unless necessary. Next meeting will be held Monday, September 11. Second Mondays of every month are the usual meeting nights for the organization.

Canada PCA Plans '51 Meeting

Plans for the 9th Annual Canadian PCO Conference were started at a Canadian PCA directors' meeting held June 3 at the Lasalle Hotel, Kingston, Ontario.

Time and place for the prospective conference was set for May 7-9, 1951, at Ontario Agricultural College, Guelph, Ontario. Co-chairmen for this and all future meetings will be Father Oliva Fournier of the University of Montreal and Prof. R. H. Osburn.

Names of the association's Board of Directors elected at their 8th Annual Conference held early this year have just recently been announced. They are: Jack Rudick, Montreal, President; Fred Lieghton, Montreal, Victor Prentice, Toronto, and J. W. Alderson, Winnipeg, regional vice-presidents. Directors include: A. R. Huntington, Vancouver; J. J. Parent, Windsor; Stan Burton, Kingston; and, Horace Maheu, Quebec. J. L. McNulty of St. John is liaison officer.

Ga. PCA Elects R. L. Tindol

R. L. Tindol, Jr., of Orkin Exterminating Co., Inc., Atlanta, Ga., became president of the Georgia Pest Control Association at an organization meeting held at Hotel Piedmont, Atlanta, May 26 and 27. New vice-president is Wilbur Dornbach, NoVex Company of Atlanta, and Fred Wright of Wright Pest Control, Augusta, was elected secretary-treasurer. Directors include Glen Burnett, Getz Exterminating Co., Atlanta; Karl Conradi, Conradi Pest Control, Thomasville; and, Luther Pitts, Biltmore Exterminating, Atlanta.

Two U. S. Public Health Service experts, Kent Littig and Harry Essick, spoke to meeting attendees on safety with pesticides and improvement in the relationship between the pest control industry and health agencies, respectively. Discussions on new insecticides were also given by G. H. Burnett, Robert M. Russell and E. H. Reese, Jr.

Other speakers included Charles Alden, State Entomologist, on legislation, and Al Greever, Fred Wright and Marcus Kaplan who conducted a forum on the proper approach to termite problems. Rodenticides, uses and mixing, were covered by Fred York and Wilbur Dornbach. A panel discussion with J. J. McManus, U. S. Food and Drug Administration, and Herman L. Fellton, Orkin Exterminating Co., on obtaining customer cooperation, ended the activities.

An auxiliary ladies group was also organized by members' wives attending the meeting. Mrs. Luther T. Pitts became president with Mrs. R. L. Tindol, Jr., elected as vice-president, and Mrs. Fred P. Wright, secretary-treasurer. Corresponding secretary is Mrs. R. M. Russell.

CALENDAR OF MEETINGS

National Shade Tree Conference, Syracuse, N. Y., Aug. 21-25.

New Jersey PCA One-Day Clinic, Rutgers University, New Brunswick, N. J., Aug. 22.

National Association of Sanitarians 14th National Conventions, Hotel Jefferson, St. Louis, Mo., Aug. 23-25.

National Chemical Exposition, Coliseum, Chicago, Ill., Sept. 5-9.

National Agricultural Chemicals Association Meeting, Essex & Susex Hotel, Spring Lake, N. J., September 6-8.

American Institute of Baking Sanitation Courses, Melbourne Hotel, St. Louis, Mo., Sept. 10-13; repeated, Hotel Whitcomb, San Francisco, Calif., Oct. 1-4.

Professional Exterminators Association Meeting, Museum of Natural History, New York, Sept. 11.

Special Training in Rodent Control, Topeka Field Training Center, Topeka, Kansas, Sept. 11-22.

New York State Association of Milk & Food Sanitarians Annual Meeting, Hotel Syracuse, Syracuse, N. Y. Oct. 2-4.

Rat-Borne Disease Prevention and Control Training Course, Communicable Disease Center, Atlanta, Ga., Oct. 2-20.

National Safety Congress, Chicago, Ill., Oct. 16-20.

National Pest Control Association Annual Convention, Netherland Plaza Hotel, Cincinnati, Ohio, Oct. 22-25.

American Public Health Association Annual Meeting and Exhibition, Kiel Auditorium, St. Louis, Mo., Oct. 30-Nov. 3.

Chemical Specialties Manufacturers Association, Inc., 37th Annual Meeting, Hotel New Yorker, New York City, December 3-5.

North Central Weed Control Conference, Milwaukee, Wisc. Dec. 12-14.

American Association of Economic Entomologists Meeting, Denver, Colo., Dec. 18-21.

Canadian Pest Control Operators Association 9th Annual Conference, Ontario Agricultural College, Guelph, May 7-9, 1951.

THE SPOTLIGHT'S ON

RESIDEX

for QUALITY
PERFORMANCE
RELIANCE

RESIDEX CHLORDANE PRODUCTS ALWAYS WILL BE MADE FROM THE BEST AVAILABLE MATERIALS

SHARPLY REDUCED PRICES MAKE RESIDEX THE LOGICAL CHOICE FOR THIS SEASON'S NEEDS . . .

SPECIFICATIONS AND SCHEDULES ON REQUEST

RESIDEX
CORPORATION
FOOT OF CENTRE STREET, NEWARK (2) N. J.
PHONE, MARKET 3-0566

MICE-GLUE

GETS MICE LIKE FLYPAPER GETS FLIES

7½ lbs. $5.00 25 lbs. $13.50 100 lbs. $45.00

BIRD-REPELLENT

Keep Pigeons, Starlings and Other Birds from Buildings

7½ lbs., 75c lb. 25 lbs., 65c lb. 100 lbs., 60c lb.

PEST CONTROL CHEMICALS CO.

324 BROADWAY WRITE FOR DETAILS BUFFALO, N. Y.

ASARCO BRAND

THALLIUM SULPHATE

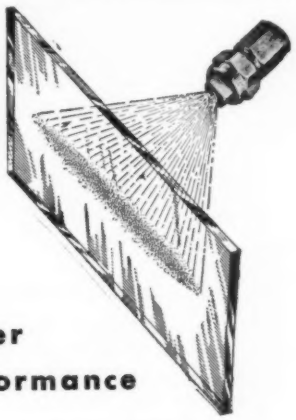
FOR

PEST and RODENT CONTROL

AMERICAN SMELTING & REFINING CO.

120 Broadway New York 5, N. Y.

SPRAYING SYSTEMS
TeeJet
SPRAY NOZZLES



BODY

CAP

STRAINER with monel metal screen

interchangeable ORIFICE TIP

better performance

For the residual spraying of insecticides, you will find TEEJET spray nozzles give the uniform distribution and proper atomization necessary for an effective spraying job. TEEJET spray nozzles are precision built with a wide range of interchangeable orifice tip sizes. Write for complete information.

SPRAYING SYSTEMS CO.
Engineers and Manufacturers
3221 RANDOLPH STREET • BELLWOOD, ILLINOIS (Suburb of Chicago)

Members of the Hawaii Pest Control Association had Mr. Theodore Siebert, president of Paramount Pest Control Service, Cal., speak before them while he was vacationing recently in Hawaii. Top row, left to right are: Ralph Marlowe, E. L. Forde, William Komoda, Clement Ching, Theodore Siebert, David Warner, Harold Hilts and B. J. Lundquist. Bottom row, left to right: C. J. Koto, R. Luke, Sung Hin Au, Frank Katsura, George Ukishima, Robert Maru and G. Ibara.

Mo. PCA Talks Rural Service

Pest control in rural areas was under discussion at the regular quarterly meeting of the Missouri Pest Control Association, Daniel Boone Hotel, Columbia, Mo., May 27.

Speakers from Missouri State University and the Extension Services described the need that farmers and small towns had for experienced pest control service. Weed spraying, livestock and farm building fly control, rodent, mole and cotton rat control, fogging and control of pests affecting farm crops were given as opportunities open to PCOs in rural areas.

Miss. PCA Agrees On Rules

To discuss changes in pest control regulations for the state of Mississippi, Dr. Clay Lyle, State Plant Board entomologist met with the Mississippi Pest Control Association May 27 in Jackson. In a fine spirit of cooperation which existed throughout many lengthy discussions, the meeting ended with all regulation changes mutually agreed upon.

E.Pa. Lady Bugs Make Toys

Stuffed dolls and toy animals are currently being made by the Lady Bugs of the Eastern Pennsylvania Pest Control Association for distribution at Christmas time. The group met June 15 at the Robert Morris Hotel, Philadelphia, for a dinner, after which the ladies began their work on the toys.

They also prepared a gift for Jeanette Fleming, recent addition to the Dale Flemings, Fleming, Inc. of Philadelphia.

NSDA Elects Officers

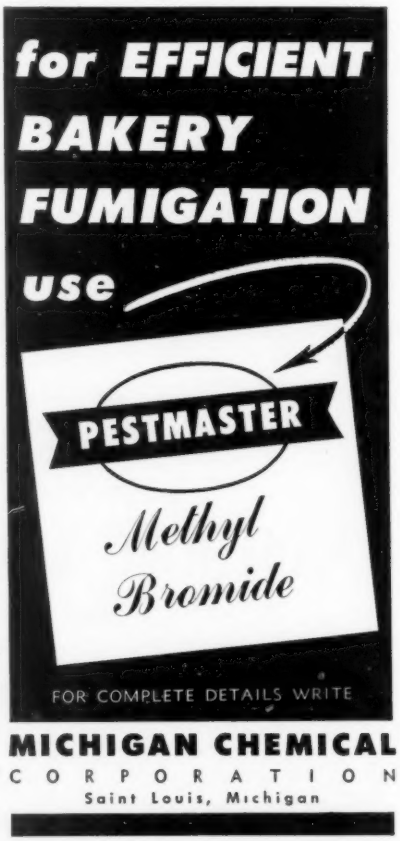
The National Sprayer & Duster Association, at its fifth annual meeting held in Chicago recently, reelected its former slate of officers for the coming year. C. D. Leiter, sales manager, F. E. Myers & Bro. Co., Ashland, Ohio, was reelected president of the Association and chairman of the executive board. R. B. Chapin, president of the R. E. Chapin Mfg. Works, Inc., Batavia, N.Y., was reelected vice-president. Dave P. Lewis, H. D. Hudson Mfg. Co., Chicago, Ill., continues as treasurer, and Earl D. Anderson and Frank J. Zink of Frank J. Zink Associates were again retained as secretary and counsel respectively. Reelected to the executive board, in addition to the officers named, were: P. L. Hauser, sales manager, Lowell Mfg. Co., Chicago; H. F. Brandt, president, Dobbins Mfg. Co., Elkhart, Ind.; R. C. Hundson, president, H. D. Hudson Mfg. Co., Chicago, Ill.; and T. M. Burton, vice president, D. B. Smith & Co., Inc., Utica, N. Y.

House Votes Probe of Chemicals Used In Food

A congressional investigation of the use of chemicals in the production and processing of foods was authorized by the house late in June when it unanimously approved Sabath H. Res. 323. The investigation is to be made by seven members. Representative James J. Delaney of New York is expected to head the group.

The resolution was approved without any voice of criticism after it was explained that the purpose of the investigation is to find out whether the use of chemicals such as fertilizers, insecticides, emulsifiers, etc., in the production and processing of foods may have a toxic effect over an extended period of time.

Representative Walter H. Judd of Minnesota, a physician and surgeon by profession, expressed strong endorsement of the investigation, as did Representative Arthur L. Miller of Nebraska, a former state director of health. They described it as one urgently needed in public health today.



Senco

SENCO PHOSPHORUS PASTE. Commonly called rat and roach paste. A specific application for the larger species of roaches. Also an attractive and effective rat poison.

10 lbs. $ 5.00 — 50 lbs. $19.00
25 lbs. 10.00 — 100 lbs. 35.00

SENCO ARSENIC SOLUTION. A 9 to 1 Concentrate. One gallon plus nine gallons of water, makes **TEN GALLONS** of a toxic drink for rats and mice.

One gallon $6.00 — Five gallons $25.00

SENCO MICROFINE ARSENIC Kills rats and mice. Three times more toxic than ordinary powdered arsenic.

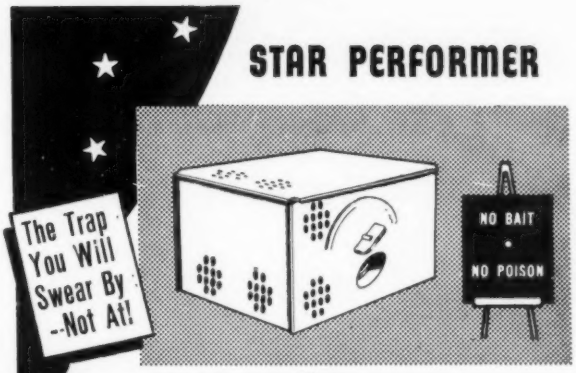
10 lbs. $ 5.00 — 50 lbs. $12.00
25 lbs. 8.00 — 100 lbs. 22.00

POISON GRAINS FOR MICE. Strychnine or Thallium treated Canary Seed, and other grains. Write for complete price list.

SENCO PRODUCTS
ARE SHIPPED FREIGHT PREPAID
(In the U. S. A. Only)
2% Discount if check is sent with order.

•

SENNEWALD DRUG CO., Inc.
Established in 1855
2721 Chouteau Ave. St. Louis 3, Mo.



STAR PERFORMER

automatic
KETCH-ALL MOUSE TRAP

No Bait — No Poison
Catches 15-20 Mice with One Setting.
Safe — Sanitary — Effective
Minimizes Chance of Rodent Hair Contamination.

Economize with the best, specify KETCH-ALL traps. The modern effective trap. Special PCO trade price $32.00 doz. prepaid. Retail $4.50 each.

DON'T DELAY . . . ORDER TODAY

Ketch-All World's Finest Mouse Trap
ALBIA PRODUCTS CO.
One East 42nd St., New York 17, N. Y., MUrray Hill 7-3766

Faucet Not Included

TRU-OIL-GAGE
FOR 55 GALLON DRUMS

•

Accurate - Convenient
Easily Installed
No Parts to Get Out of Order

Designed on the simple, trouble-free and most accurate principle of liquid seeking its own level. No more guessing—no more messy "stick" measuring. Reserve in the drum is noted at a glance. Diagram with instructions on each carton. Important — Safety valve checks the flow in case of accident or fire.

PRICES
$3.50 Each
6 or More, $3.00 each
f. o. b. Cleveland, Ohio

SUPERIOR
EQUIPMENT COMPANY
3204 St. Clair Ave. Cleveland 14, Ohio

NEED HOSE?

Then get PCE's long-wearing light weight, kink-resistant and oil-resistant hose! It's the finest money can buy. Available from stock with or without fittings. Check your needs now!

PRICES

¼" I. D. (working pressure 250 PSI; bursting 1500 PSI)
23c ft. more than 10 ft. net
33c ft. 10 ft. or less, net

3/8" I. D. (working pressure 200 PSI. bursting pressure 1000 PSI)
25c ft., over 100 ft., net
33c ft., 100 ft., or less, net

WRITE FOR CATALOG

PCE
Pest Control Equipment Co.
47 W. 43rd St. New York 18, N. Y.
VAnderbilt 6-5390

ONE SUBSCRIBER WRITES:

"PEST CONTROL is really packed full of a

Whale of a lot of Good Information"

Advertisements, too, are Well Read in

PEST CONTROL
FORMERLY PESTS AND THEIR CONTROL

If you sell pest control supplies, chemicals or equipment, we suggest you investigate the advertising opportunities in this monthly trade magazine pest control men have

READ SINCE 1933

PEST CONTROL
1900 Euclid Bldg. Cleveland 15, Ohio

Read every month by over 3,000 PCOs, exterminators, fumigators, termite operators, public and industry sanitation officials, food storage warehouse men, other large users of pest control materials, supply houses of pest control supplies and equipment.

EXTRACT from Experiment Station Reports

By PAUL HERBERT

Roach Control

After testing various new products for control of German cockroaches, Dr. Geo. E. Gould, associate professor of entomology at the Purdue agricultural experiment station, Lafayette, Ind., has concluded that in homes the best treatment is a coarse spray of 2 per cent chlordane in oil, applied to hiding places. Perhaps the best dust to use, he states in the Purdue station's 1949 report, is a mixture of sodium fluoride 50 percent, pyrethrum powder 25 percent and pyrophyllite 25 percent, while sodium fluoride 10 percent, DDT or 5 percent chlordane are also effective. Commercial dust mixtures of pyrethrins and a piperonyl are also good roach powders and are non-poisonous to man and household pets, the report states.

Dr. Gould's conclusions were based on studies with various new synthetic insecticides, as well as plant materials, rotenone and pyrethrum, and synergists. Continuing, the station report says: "Of the new chlorinated hydrocarbon compounds, DDT was used as the basis of comparison and gave better kills in these tests than the pp'DDT, fluoro-DDT, ditolyl trichloroethane, DDD, methoxychlor and pp' methoxychlor. On the other hand, the aerosol grade of DDT, chlordane and toxaphene were more effective than DDT.

"Several commercial and laboratory mixtures of pyrethrum extract with either piperonyl cyclonone or piperonyl butoxide gave excellent results. A mixture containing .04 percent pyrethrins used with the butoxide as an activator have a 67 per cent control. While it required a .5 percent strength of pyrethrins impregnated on pyrophyllite, or a .15 per cent strength of pyrethrins in the form of pyrethrum powder for an 80 per cent kill. Rotenone powder gave no kill of roaches, while a 5 per cent extract impregnated on pyrophyllite gave a 62 per cent kill. Piperonyl butoxide gave no activating effect to rotenone extract."

—BOOK REVIEW—

MEDICAL ENTOMOLOGY
By Robert Matheson

The role insects play in human disease, both as hosts to parasites that attack man and as mechanical carriers of disease, has been appreciated as never before since World War II.

During and since the war extensive investigations in this field have pushed the frontiers of our knowledge far beyond where they were in 1932, when the first edition of *Medical Entomology* came out. Compietely rewritten with 85 *new* illustrations (242 illustrations in all), this second edition of Dr. Matheson's *Medical Entomology* will bring entomologists, pest control operators, doctors, and other specialists in public health up to date on methods of insect control and on the life histories and structure of disease-carrying insects. Each chapter is provided with an extensive and up-to-date bibliography for use of the reader.

Dr. Matheson, now Professor Emeritus, taught entomology at Cornell University from 1909 until 1949. He is well known for his work in this field.

The second edition of *Medical Entomology*, published in January 1950, contains 612 pages and can be obtained by sending $7.75 to *Pest Control* magazine.

CLASSIFIED ADVERTISEMENTS

When answering ads where box number only is given, please address as follows: Box number, c/o Pest Control, 1900 Euclid Building, Cleveland 15, Ohio.

Rates: "Position Wanted" 5c per word, minimum, $1.00. All other classifications, 10c per word, minimum $2.00. All classified ads must be received by Publisher at least two weeks preceding publication date and be accompanied by cash or money order covering full payment.

FOR SALE

Exterminating business. Grosses $30,000 yearly. Includes neon sign, chemicals, equipment. Monthly contracts average $24,000 per year. Price $20,000. New York City areas. Those qualified to buy, not to bargain need apply. Box 797 New York City.

FOR SALE

Exterminating business. Approximately $50,000 gross. 4 trucks. Termite pressure equipment. Several hundred gallons chemical in store. 500 monthly insect-rodent control contracts. 200 5-year termite control contracts, with nice yearly fee. Office equipment. Very little competition. Complete $35,000. Write Box 235, Pest Control magazine.

WANTED TO BUY

Exterminating business in Chicago or surrounding area. Will also consider buying into part of progressive organization. Write Box 236, Pest Control Magazine.

WANTED TO BUY

Want to buy exterminating business in Eastern United States. Will pay cash. Write Box 237, Pest Control magazine.

"RAT-GLU"

CATCHES RATS AND MICE LIKE Flies on Flypaper

NEEDS NO POISON OR BAIT

For Prices and Particulars Write To

JOSEPH GABOS

South Delsea Dr., R.F.D. 6 Vineland, N. J.

The Post Office No Longer Forwards Magazines

---So, if you change your address, be sure to send both your old address and new one to

PEST CONTROL

1900 Euclid Bldg. Cleveland 15, Ohio

PESTALES

Rats Are A Dam Nuisance

Rats! said the people of Isogawa Village in Japan when the banks of their town reservoir, two houses and a bridge suddenly collapsed. Water also flooded 30 houses.

Villagers discovered rats had dug too many burrows in the reservoir banks. Five hundred engineers are studying the problem.

What the villagers need is fewer draftsmen and more good ratmen.

* * * *

Tomcat Draws Salary

Whiskey, a black and white office cat in Melbourne, Australia, gets a salary and three weeks vacation for rat catching.

Whiskey sauntered into a local office seven years ago and started killing off the company warehouse rats. Firm officials were so pleased that they started paying five shillings (50 cents) a week for Whiskey's food bill. He also gets two weeks vacation at Xmas and a week at a home for cats and dogs for Easter.

Hope American cats don't hear about this — they'll want social security and a pension too.

* * * *

Cheeseface

Jiggs, a cat owned by Mrs. David Lewis of Brazil, Ind., when eating cheese saves the last scraps to smear on his face. He then poises his face close to a mouse hole and waits for the aroma to draw mousy out of hiding. It doesn't take long, the Lewises say, for nature and Jiggs to do the rest.

* * * *

Swatter Smells From Cleveland

A factory near Cleveland, Ohio, is making a fly swatter that emits an odor, perfumed to the owner's taste, with every swat.

What won't they think of! Next thing you'll be able to get is an embalming kit and two pallbearers with every mouse trap.

ADVERTISERS' INDEX

Acme Protection Equipment Co. . . 33
Agency: Fred H. Ebersold, Inc.
Albia Products Co. 39
Agency: Golden Advertising Agency
American Cyanamid Co. 21
Agency: Hazard Advertising Co.
American Fluoride Corp. 26
American Smelting & Refining Co. 37
Associated Sales & Supply Co. June
John Bean Division Food Machinery Corp. 35
Agency: Wallace-Linderman, Inc.
B & G Company 7
Breuer Electric Mfg. Co. . . . . July
Agency: Gebhardt & Brockson, Inc.
Broadway Rubber Corp. . . . . June
California Spray-Chemical Corp. 17
Agency: Cosby & Cooper
R. P. Cargille . . . . . June
Agency: Altomari Advertising Agency
Chapman Chemical Co. 15
Agency: William K. Grimm
Chek Products Co. 33
Chemical Insecticide Co. . . . . June
Agency: Klores & Carter, Inc.
Chipman Chemical Co. . . . . June
Continental Chemiste Corp. . . . July
Cre-O-Tox Chemical Co. 35
The Dow Chemical Co. . . 3rd cover
Agency: MacManus, John & Adams, Inc.
Dyna-Fog Corp. 4
Agency: Hipple Advertising Agency
E. I. duPont de Nemours . . . . July
Agency: Batten, Barton, Durstine & Osborn, Inc.
Elkay Products Co. . . . . July
Agency: Burke, Advertising Agency
Ewing Manufacturing Co. 29
Joseph Gabos 41
H. D. Hudson Mfg. Co. 26
Agency: John W. Shaw Advertising, Inc.
Idico Products 32
Agency: John Shrager, Inc.
Innis, Speiden & Co. 32
Agency: The House of J. Hayden Twiss
Kennametal, Inc. . . . . July
Agency: W. S. Hill Co.
Keyes-Tiefel Chemical Corp. . July
Lethelin Products Co., Inc. 33
Agency: Conklin-Mann Corp.
Michigan Chemical Corp. 38
Agency: Don Wagnitz Advertising
Monsanto Chemical Co. . . . . July
Agency: Gardner Advertising Co.
National Pest Control Association . 23
S. B. Penick & Co. 8
Agency: Murray Breese Associates, Inc.
Pennsylvania Refining Co. . . . . July
Agency: Walker & Downing
Per-Mo Products Co. 34
Pest Control Chemicals Co. 37
Pest Control Equipment Co. 25, 35, 39, 4th cover
Agency: Givaudan Advertising, Inc.
John Powell & Co., Inc. . . 2nd cover
Agency: Picard Advertising Co.
R. J. Prentiss & Co., Inc. 25
Agency: The House of J. Hayden Twiss
Residex Corp. 37
Agency: Homer Harding
A. H. Richards & Sons . . . . . June
Sennewald Drug Co., Inc. 39
Spraying Systems Co. 37
Agency: Advertising Producers Associated
Stangard Pigeon & Bird Repellent Co. . . . . June
Superior Equipment Co. 34, 39
Agency: Complete Advertising Service
Tetco Co. 19
Agency: W. B. Geissinger & Co.
Todd Shipyards Corp. 29
Agency: Wendell P. Colton Co.
U. S. Industrial Chemicals 13
Agency: G. M. Basford Co.
Universal Paper Products Co. . . . 31
Agency: Al Paul Lefton Co., Inc.
Velsicol Corp. . . . . July
Agency: E. Ross Humphrey & Associates
B. & D. A. Weisburger 26
Wisconsin Alumni Research Foundation . . . . . July
Agency: Arthur Towell, Inc.
Wood Treating Chemicals Co. 3
Agency: Florence Majers, Inc.

Hyman V.P., Treasurer Named

At a recent meeting of the Board of Directors of Julius Hyman & Co., Denver, Colorado, Newton J. Hall was elected vice-president in charge of sales and merchandising and Dr. Lloyd M. Joshel was named treasurer of the company.

Mr. Hall has been sales manager of Julius Hyman & Co. since it was organized in 1946. Previously he was with the War Production Board in Washington, D. C.

Dr. Joshel has been purchasing agent of the company from its beginning, and he, too, had previously been with the War Production Board.

Source for Zinc Phosphide

The rodenticide, Zinc Phosphide, is no longer manufactured by Merck & Co., Rahway, N. J. Apparently the only U. S. manufacturer is Oldbury Electro-Chemical Co., Niagara Falls, N. Y., with offices at 19 Rector St., New York City 6. It is packed in small quantities and distributed by several firms in the country.

Pest Control Notebook

(from page 24)

erally sprayed with wettable chlordane to kill off at least one dense population of spiders which was furnishing the wasps with supplies for their nests.

Conclusions

I am not at all sure that anything more than temporary relief was accomplished.

Editor's Note: Mud daubers catch and stock their nests with spiders. The spiders are not killed, but only paralyzed and left in a state of suspended animation. The wasp's young thus are able to feed on fresh meat every day until they are fully grown and ready to pupate.

Treating an elevator boot with Dowfume EB-15, ideal for local machinery and spot fumigations—designed to be used at regular intervals between general space fumigations with Dow Methyl Bromide. Note: Operator has gas mask readily available.

OUR business is YOUR business...

BETTER FUMIGATION!

Better fumigation is your business—and ours, too! At Dow, a large technical staff is engaged not only in developing new fumigants to broaden your service scope, but in thorough testing, proving, then *improving* each product to give you and your customers the maximum in dependability and performance. And beyond the testing in Dow laboratories is actual testing in every field of pest control.

All this added together is assurance of quality fumigants, each designed to do specific jobs—of correct recommendations and precautions for use—of better fumigation. The *complete* line of Dow fumigants enables you to offer *complete* fumigation service with outstanding results in every case.

when you buy fumigants . . .
buy DOW DIAMOND quality

DOW METHYL BROMIDE • DOWFUME EB-15 • DOWFUME EB-5
DOWFUME MC-2 • DOWKLOR • DOWFUME 75 • PICRIDE

FUMIGANT DIVISION

THE DOW CHEMICAL COMPANY

MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Atlanta • Cleveland • Detroit
Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle
Dow Chemical of Canada, Limited, Toronto, Canada

DOW
CHEMICALS
INDISPENSABLE TO INDUSTRY AND AGRICULTURE

IT PAYS TO GET TO KNOW PCE

LUCIDE FORMULAS

NOW COST LESS - DO MORE FOR YOU

SUPERIOR CHLORDANE FORMULATIONS

LUCIDE A-20, a true colloidal emulsion of refined grade chlordane. 1 Part Lucide A-20 plus 9 parts of water equals 10 parts 2% Chlordane Emulsion.

LUCIDE S-60, a water miscible oil containing 60.3% refined grade chlordane. 1 Part Lucide S-60 plus 39 parts of water equals 40 parts of 2% Chlordane Solution.

Lower concentrates as well as ready-to-use insecticides, all of permanent stability, may be made from either of these formulations by the simple addition of water. They are ideal to repackage for over-the-counter sales.

STABLE IN HARD WATER, TOO!

On the job they have longer lasting residual effect in areas subjected to wetting. Ready to use products made from these concentrates do not require agitation. They give you the same formulation from top to bottom, are completely fire-proof. They will not clog nor harm brass or stainless steel spraying equipment.

LUCIDE A-20

Is for the PCO who wants to carry lower concentrates to the job and merely add water to get an extremely stable, ready to use insecticide. Lucide A-20 is the easiest of all concentrates to use.

55 GAL. LINED DRUMS
$3.45 PER GAL.

5 GAL. LINED DRUMS
$3.95 PER GAL.

1 GAL. GLASS BOTTLE
$5.45 PER GAL.

All prices F. O. B. N. Y. C.

LUCIDE S-60

Is for the PCO who wants a high concentrate to save money in shipping and space in storing. It makes lower concentrates, or ready-to-use insecticides. It keeps indefinitely in original shipping containers.

55 GAL. LINED DRUMS
$10.85 PER GAL.

5 GAL. LINED DRUMS
$11.35 PER GAL.

1 GAL. GLASS JARS
$12.35 PER GAL.

All prices F. O. B. N. Y. C.

Write for our catalog of equipment and supplies for the PCO

PEST CONTROL EQUIPMENT CO.

47 West 43rd Street **New York 18, N. Y.**

VAnderbilt 6-5390

Send Your Order Today!

Printed in U.S.A.